

Final

Work Plan

Non-Time-Critical Removal Action

Arsenic Area of Concern

FORMER MARINE CORPS AIR STATION
TUSTIN, CALIFORNIA

July 2004

Prepared for:



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EXECUTIVE SUMMARY

This work plan presents the implementation plan for the non-time-critical removal action for fill soil contamination at the Arsenic Area of Concern (AOC) at the former Marine Corps Air Station (MCAS) Tustin, Orange County, California. The work plan has been prepared by Accord Engineering, Inc. and Earth Tech, Inc. (Accord Team) on behalf of the United States (U.S.) Department of the Navy (DON), Southwest Division, Naval Facilities Engineering Command (NFECSW SDIEGO; formerly abbreviated as SWDIV), in accordance with contract no. N68711-04-C-1006.

The removal action at the Arsenic AOC is undertaken pursuant to Comprehensive Environmental Response, Compensation, and Liability Act and the National Oil and Hazardous Substances Pollution Contingency Plan under the delegated authority of the Office of the President of the U.S. by Executive Order 12580. This order provides the DON with authorization to conduct and finance removal actions.

Former MCAS Tustin is located within central Orange County in southern California, approximately 1 mile southeast of Santa Ana and 9 miles north of Laguna Beach. Former MCAS Tustin covers approximately 1,600 acres. The Arsenic AOC is located in the south-central area of MCAS Tustin and is associated with Buildings 190 and 251. The removal action at the Arsenic AOC is consistent with the selected removal action documented in the Action Memorandum (AM) for the Arsenic AOC. The scope of this removal action includes excavation of approximately 4,900 bank cubic yards of arsenic-contaminated fill soil, and disposal at an appropriate off-station disposal facility. The selection of the off-site disposal facility will be based on the characterization of the arsenic-contaminated fill soil, and in accordance with the requirements of 40 Code of Federal Regulations Section 300.440 (a)(1)(3) and (4). Following excavation of the soil at Building 190, confirmation sampling at the bottom of the excavation will be performed to confirm that the cleanup goals (cleanup to the background arsenic concentration of 17.5 mg/kg in the soil) are attained. At Building 251, only those arsenic concentrations above two times the background level will be excavated. If test results indicate a greater area of contamination than initially estimated, additional soil will be removed and confirmation sampling will be repeated until the soil cleanup goals have been attained. Once the confirmatory sampling results indicate that the soil cleanup goals have been met, the excavated areas will be backfilled using clean fill material and compacted.

The removal action at the Arsenic AOC will be implemented to comply with all the applicable or relevant and appropriate requirements identified in the AM and the removal action objectives identified in the engineering evaluation/cost analysis. This work plan presents the excavation design and procedures to implement excavation and off-site disposal of the arsenic contaminated fill soil. Additionally, the work plan describes the procedures for profiling and characterization of excavated soil, characterization of the backfill material, and confirmation sampling design.

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ACRONYMS AND ABBREVIATIONS

Accord Team	Accord Engineering, Inc. and Earth Tech, Inc.
AM	Action Memorandum
AOC	area of concern
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society of Testing Materials
BCI	BRAC Cleanup Team
bcy	bank cubic yards
bgs	below ground surface
BEC	BRAC Environmental Coordinator
BMPs	best management practices
BNI	Bechtel National, Inc.
BRAC	Base Realignment and Closure
Cal. Code Regs.	California Code of Regulations
Cal-EPA	California Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
ch.	chapter
CO	Contracting Officer
CQC	Construction Quality Control
cy	cubic yards
DFOW	definable feature of work
DON	Department of the Navy
DTSC	Department of Toxic Substances Control
EE/CA	engineering evaluation/cost analysis
EPA	Environmental Protection Agency
Fed. Reg.	Federal Register
HSO	Health and Safety Officer
IAS	initial assessment study
MCAS	Marine Corps Air Station
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NCR	Non Conformance Report
NFA	No further action
NFEC SW SDIEGO	Southwest Division, Naval Facilities Engineering Command
NPDES	National Pollutant Discharge Elimination System
PA	preliminary assessment
QA	quality assurance
QAO	Quality Assurance Officer
QC	quality control
RA	removal action
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board
SAP	sampling and analysis plan
§	Section
SCAQMD	South Coast Air Quality Management District
STLC	Soluble Threshold Limit Concentration

SWDIV	Southwest Division, Naval Facilities Engineering Command
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
IBC	to be considered
TCLP	Toxicity Characteristic Leaching Procedure
tit.	Title
U.S	United States
U.S.C.	United States Code
WET	Waste Extract Test

1. INTRODUCTION

This Work Plan presents a technical approach for the implementation of the non-time-critical removal action for fill soil contamination at the Arsenic Area of Concern (AOC) at the former Marine Corps Air Station (MCAS) Tustin, Orange County, California (Figure 1-1). The two principal components of this document include a Work Plan (main body of this document) and a Sampling and Analysis Plan (SAP) (Appendix A). The Work Plan presents the design and implementation plan for removal action, assigns responsibilities for different tasks, and establishes the project schedule. The SAP delineates technical objectives, data acquisition and assessment procedures, and quality assurance (QA) and quality control (QC) requirements for sampling and analyses conducted as a part of the removal action.

The removal action at the Arsenic AOC is consistent with the selected removal action documented in the Action Memorandum (AM) for the Arsenic AOC (Department of the Navy [DON] 2004). This removal action is taken pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) under the delegated authority of the Office of the President of the United States (U.S.) by Executive Order 12580. This order provides the U.S. DON with authorization to conduct and finance removal actions.

This work plan has been prepared by Accord Engineering, Inc. and Earth Tech, Inc. (Accord Team) on behalf of the U.S. DON, Southwest Division, Naval Facilities Engineering Command (NFECSW SDIEGO; formerly abbreviated as SWDIV), in accordance with contract no. N68711-04-C-1006.

1.1 SITE DESCRIPTION

1.1.1 Former MCAS Tustin Location and Background

Former MCAS Tustin is located within central Orange County in southern California, approximately 1 mile southeast of Santa Ana and 9 miles north of Laguna Beach (Figure 1-2). Former MCAS Tustin covers approximately 1,600 acres. Land use around the former MCAS includes commercial, light industrial, and residential.

Former MCAS Tustin was closed in July 1999 as part of the Base Realignment and Closure (BRAC) Act. Approximately 1,150 acres have been conveyed to the City of Tustin with remaining property either leased to the City of Tustin pending the completion of site restoration activities, or sold to private developers through public sale (Figure 1-1). Access to the station is controlled by security services. The majority of the buildings are unoccupied.

1.1.2 Site Location and Background

The Arsenic AOC was formally established by the DON in December 2000. This AOC is associated with Building 190 and Building 251, and is located in the south-central area of MCAS Tustin (Figure 1-3). The areas that constitute the Arsenic AOC include Building 190 (former AOC Sites SI-88 and MAE-03), and Building 251 (former AOC Site SI-86). Brief backgrounds of these areas are presented below:

Building 190 (former AOC Sites SI-88 and MAE-03): Building 190 was built in the late 1960s, and the northern portion of the building was used as a maintenance hangar. The southeastern corner of Building 190 was used as a spray paint booth for parts and support equipment. The majority of Building 190 is located within the footprint of former mooring pad number 6. (Figure 1-3).

Building 251 (former AOC Site SI-86): Building 251 consists of various rooms located within a hangar possibly used for hazardous materials or hazardous waste storage. The building was

constructed in the early 1980s and used as a ground support equipment facility (Bechtel National, Inc. [BNI] 2001). The building is currently vacant. Based on a review of the 1982 construction drawing, the trench drain in Building 251 is built on top of the former drainage ditch.

1.1.3 History of Previous Investigations and Nature of Contamination

The DON initiated basewide source discovery and assessment at MCAS Tustin in 1985 with an Initial Assessment Study (IAS) (Naval Energy and Environmental Support Activity 1985), which was followed up by an Addendum to the initial study in 1991. A Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) (BNI 1997) was conducted based on the results of the IAS and the IAS Addendum to identify sites where a potential release of hazardous substance(s) had occurred. The sites identified as part of the RFA program are classified as AOCs, which may require additional investigations to determine if any action is required or determine if the sites can be closed with no further action (NFA).

As part of the RFA, three AOCs were investigated: Sites ST-86 (located at Building 251), ST-88, and MAE-03 (both located at Building 190). Investigation results indicated elevated levels of arsenic in surface soil (the top 1 foot), as well as dieldrin at select locations. On the basis of the historical activities conducted at these three AOCs, the source of the arsenic and dieldrin was determined not to be from any of these AOCs. Based on the concentrations of other contaminants, NFA was granted for these three AOCs; however, a new AOC was created by combining former AOC sites ST-86, ST-88, and MAE-03 to address the elevated levels of arsenic. The Arsenic AOC was then added to the MCAS Tustin CERCLA Program.

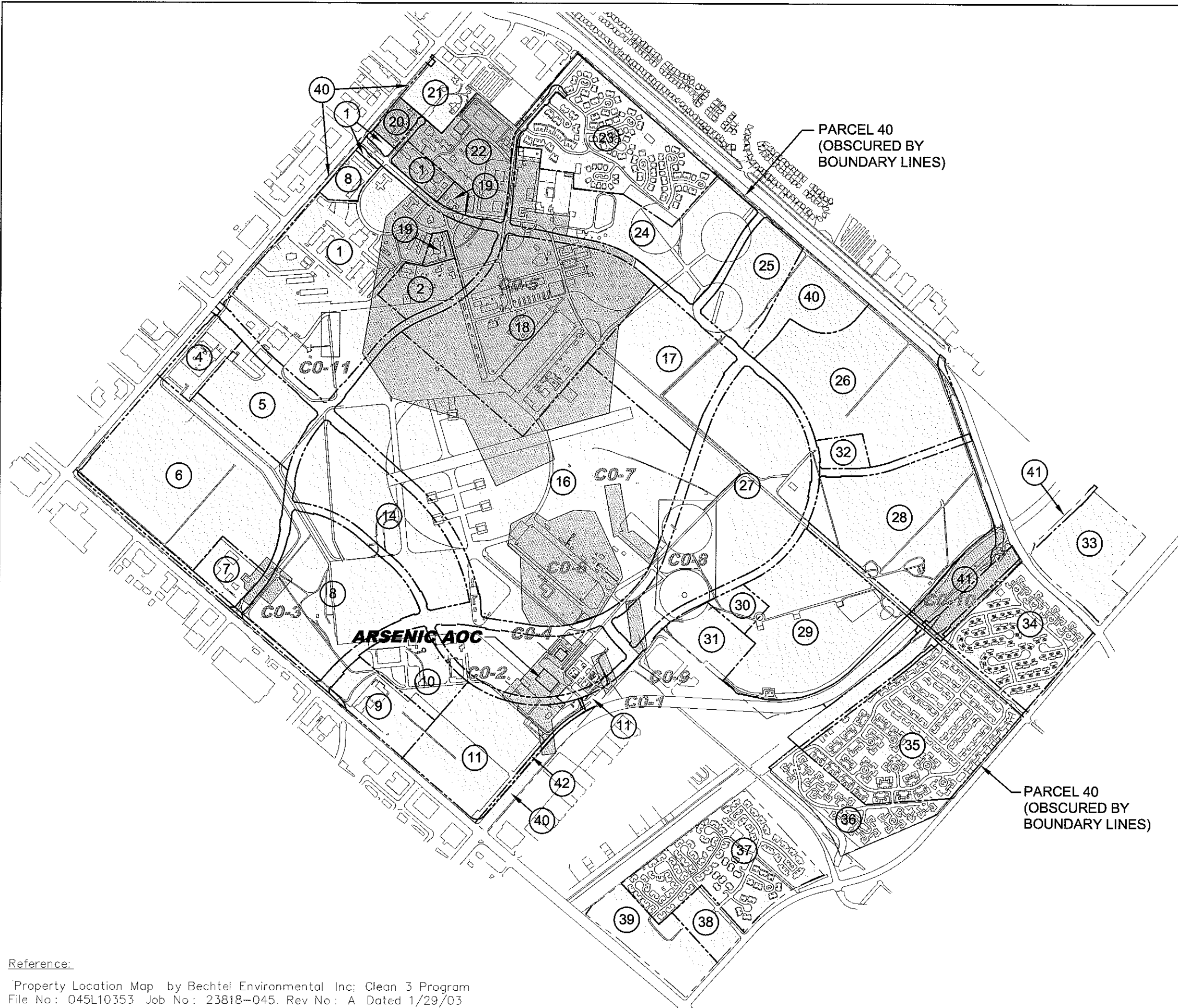
The first round of preliminary assessment (PA) of the Arsenic AOC was conducted in October 2001 (Earth Tech 2002) (see Appendix C). A review of the existing as-built drawings performed as part of the PA indicated that a major portion of Building 190 was constructed within the footprint of former mooring pad No. 6. The southeastern portions of Building 190 and Building 251 were constructed over a former drainage ditch. The as-built drawings also indicated that both buildings were constructed on fill presumably imported during two backfilling events.

Building 190 was constructed in 1969 and Building 251 was constructed in 1980. These substantially different construction periods suggest that the fill soils are not homogeneous or from the same source. Thus, the Arsenic AOC was divided into two units: the area in the vicinity of Building 190 and the area in the vicinity of Building 251.

At Building 190, fill depths ranged from 0 to 2.25 feet below ground surface (bgs). The fill within the building footprint ranged from 1.5 to 2.25 feet bgs. At Building 251, fill depths ranged from 0 to 4 feet bgs, with fill inside the building ranging from 0.5 to 4 feet bgs. The general depth of fill outside both buildings is approximately 1.5 feet bgs. Approximately 2.5 feet of fill material is present in the former drainage ditch area. The results from the PA indicate that the average concentration of arsenic in the fill (predominantly a mixture of an olive-brown gravelly sand and a sandy gravel, was easily discerned from the native soil, which was consistently a black silty clay), in and around Building 190 and Building 251 is 123 and 19 milligrams per kilogram (mg/kg), respectively, with the highest concentration of 257 mg/kg collected from the fill material near Building 190. The average concentration of arsenic in the native soil in and around Building 190 and Building 251 is 14 and 10 mg/kg, respectively.

The PA concluded that the elevated arsenic concentrations were associated with fill soils and not due to activities conducted at each building. In addition, the fill soil at Building 190 and its vicinity had a higher concentration of arsenic than the fill at Building 251. The PA also concluded that the previously detected dieldrin and aldrin were not associated with the elevated arsenic concentrations and could not be associated with building activities.

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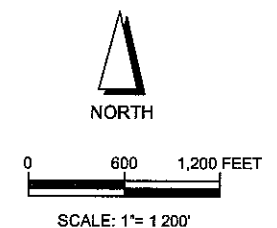


LEGEND:

- GOVERNMENT PROPERTY LINE
- PARCEL BOUNDARY
- (28) PARCEL NUMBER
- CARVE-OUT AREA
- ~~~~~ ROAD
- BUILDING OR STRUCTURE

DESCRIPTION OF PROPERTY:

- DISPOSED
- GOVERNMENT OWNED

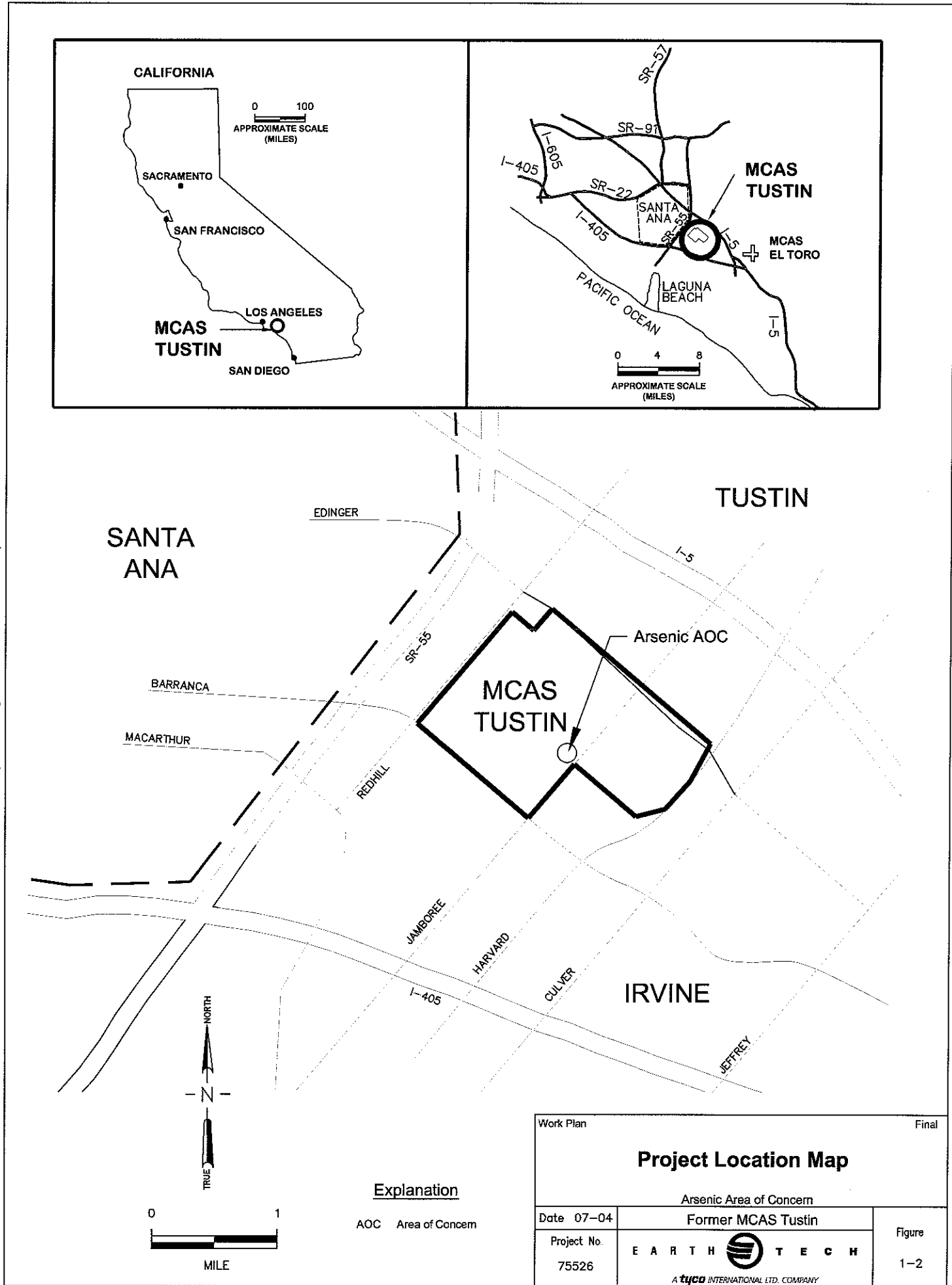


Reference:

Property Location Map by Bechtel Environmental Inc; Clean 3 Program
File No: 045L10353 Job No: 23818-045. Rev No: A Dated 1/29/03

Work Plan		Final	
Property Location Map			
Arsenic Area of Concern			
Date: 07-04		Former MCAS Tustin	
Project No. 75526		Figure 1-1	

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1. The first step is to identify the problem or question that needs to be answered.

2. Next, gather relevant information and data to understand the problem better.

3. Then, analyze the information and data to identify patterns and trends.

4. After that, develop a hypothesis or a proposed solution based on the analysis.

5. Finally, test the hypothesis or solution through experiments or observations.

6. Once the hypothesis is tested, evaluate the results and draw conclusions.

7. If the results support the hypothesis, the problem is solved. If not, revise the hypothesis and repeat the process.

8. The final step is to communicate the findings and conclusions to others.

9. This process is iterative, meaning it can be repeated as many times as needed to refine the solution.

10. The goal of the scientific method is to find a reliable and valid solution to a problem.

11. The scientific method is a systematic approach to problem-solving.

12. It involves a series of steps that lead to a conclusion.

13. The scientific method is used in many fields of study.

14. It is a way of thinking that helps us understand the world around us.

15. The scientific method is a powerful tool for discovery and innovation.

16. It is a process that allows us to test our ideas and see if they are true.

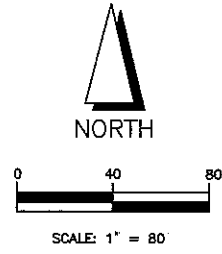
17. The scientific method is a way of thinking that is based on evidence.

18. It is a process that helps us to learn from our mistakes.

19. The scientific method is a way of thinking that is open to change.

20. It is a process that helps us to improve our understanding of the world.

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FORMER
MOORING PAD
NO. 6

BLDG.
251

BLDG. 190

BLDG. 568

Legend

- Existing Feature
- Approximate Location of Former Drainage Ditch

Work Plan		Final
Site Plan		
Arsenic Area Of Concern		
Date: 07-04	Former MCAS Tustin	Figure
Project No. 75526	EARTH TECH <small>A tyco INTERNATIONAL LTD. COMPANY</small>	1-3

A removal action was considered necessary since a human health preliminary risk evaluation estimated that the risk associated with fill soils at the two buildings exceed the typical level that would allow for unrestricted reuse. For Building 190, the estimated cancer risk was 2×10^{-4} with a noncancer hazard index of 3 for residential reuse. For Building 251, the estimated cancer risk was 8×10^{-5} with a noncancer hazard index of 1.4 for residential reuse. Based on the relatively low risk associated with Building 251 and the localized nature of the elevated arsenic concentrations, removal of these localized hotspots would achieve the cleanup objectives.

The findings of historical investigations and streamlined risk evaluation for the Arsenic AOC were presented in the Draft Engineering Evaluation/Cost Analysis (EE/CA) (Earth Tech 2003). This EE/CA identified removal action objectives and evaluated various alternatives for removal of arsenic-contaminated fill soil at Building 190 and its vicinity, localized portions of Building 251, and portions of Building 568 (located south east of Building 190). Subsequent to issuance of the Draft EE/CA and at the request of the City of Tustin to reevaluate the need to demolish Building 568 as part of removal action activities, the DON, in consultation with the Base Realignment and Closure Cleanup Team (BCT), made a decision to further characterize arsenic concentrations in the fill soils underlying Building 568, and a sampling and analysis plan (SAP) amendment (Earth Tech 2003) to the PA work plan was prepared. In accordance with the SAP amendment and with BCT concurrence, additional sampling was conducted at Building 568 and its vicinity in 2004. The results of this investigation indicated that the average concentration of arsenic within and outside the controlled fill area at Building 568 is 6.9 mg/kg and 77.02 mg/kg respectively, with the highest concentration of 105 mg/kg outside the controlled fill area. The low concentrations of arsenic within the controlled fill area at Building 568 could be explained by the fact that it was constructed on an overexcavated and recompacted fill, and has different characteristics from the fill having elevated arsenic concentrations. Based on the results of this investigation and relatively consistent arsenic concentration within the Building 568, no further investigation is required. The Draft Final EE/CA (Earth Tech 2004) thus refined the removal action scope to exclude the fill beneath Building 568.

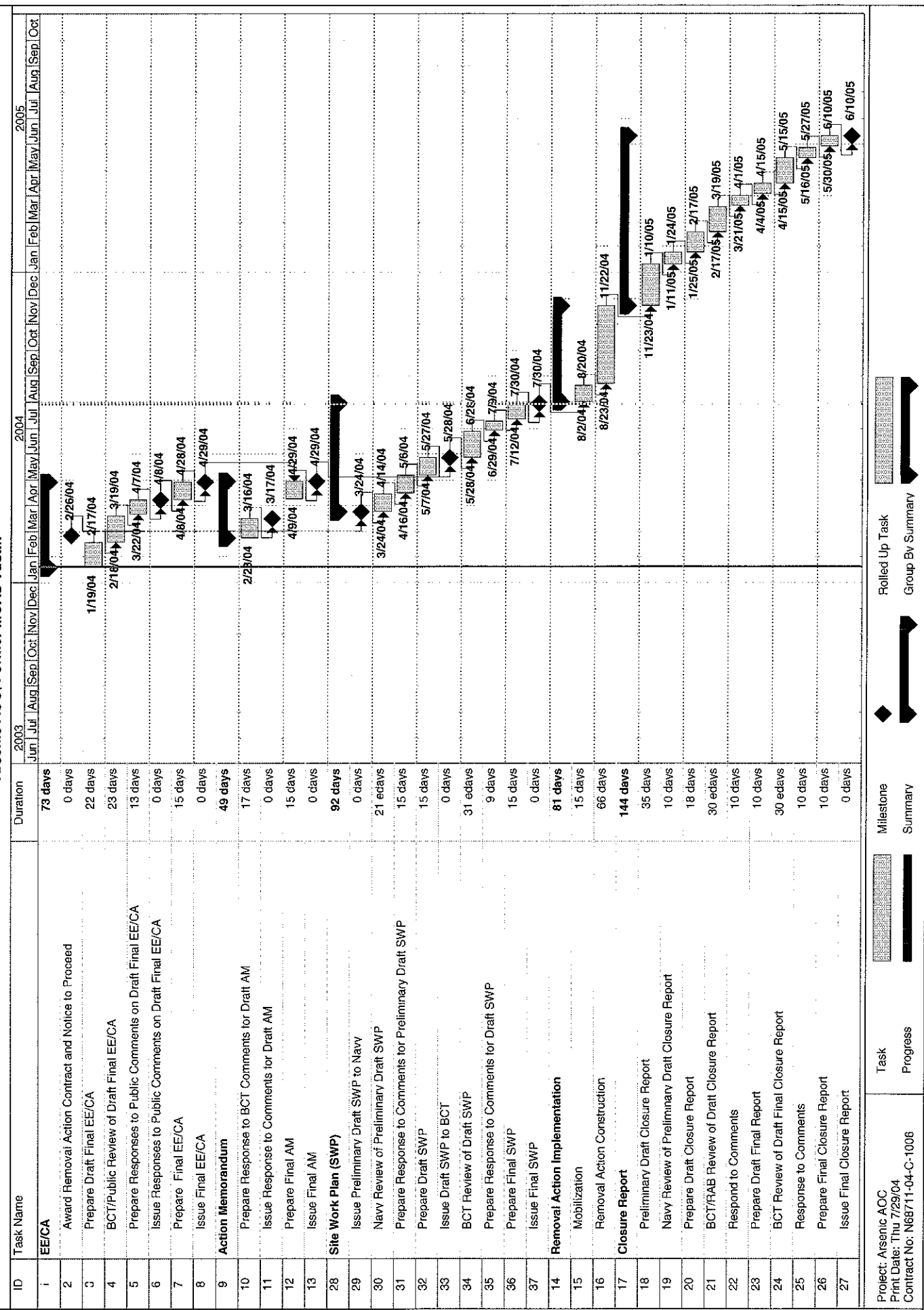
The selected remedy for the Arsenic AOC noted as Alternative 3 in the AM (DON 2004) consisted of excavation of fill with offsite treatment and disposal. This alternative would reduce the toxicity, mobility, and volume of arsenic at Building 190 and its vicinity, and at the hotspot locations at Building 251, providing long-term effectiveness and protection to human health and the environment. This alternative meets the removal action objectives and is easily implementable, and provides the best balance between costs and overall effectiveness.

1.2 REMOVAL ACTION SCHEDULE

The implementation of removal action at the Arsenic AOC will be conducted in two major phases. The initial phase consists of preparation of the removal action work plan; the second phase includes the removal action construction and preparation of the Closure Report. The anticipated schedule is presented in Figure 1-4.

**Figure 1-4 - Project Schedule
Non-Time Critical Removal Action
Arsenic AOC, Former MCAS Tustin**

Accord Engineering, Inc.
Thu 7/29/04



2. REMOVAL ACTION DESIGN

2.1 REMOVAL ACTION OBJECTIVES

The objectives of the removal action at the Arsenic AOC are consistent with those developed during the EE/CA (Earth Tech 2004) and documented in the AM (DON 2004), and are based on the site-specific contaminant of concern, i.e., arsenic, exposure pathways, and receptors.

The removal action objectives for the Arsenic AOC are:

- Remove or treat the arsenic-contaminated fill soil at the hotspot locations at Building 251 with concentrations above two times the background concentration of arsenic, i.e., 35 mg/kg at the former MCAS Tustin.
- Remove or treat the arsenic-contaminated fill soil at Building 190 and its vicinity with concentrations exceeding the background concentration of 17.5 mg/kg.
- Remove exposure pathways for dermal contact, ingestion, and inhalation of arsenic in soil.

Attainment of the above objectives will minimize the potential exposure to human health and the environment.

2.2 REMOVAL ACTION SCOPE

The scope of the removal action is to implement measures designed to protect against the threat to human health caused by arsenic contamination in surface and subsurface soil. The removal action is consistent with BRAC cleanup objectives to provide permanent and cost-effective cleanup remedies for contaminated soil, and to permanently and significantly reduce the toxicity, mobility, and volume of hazardous wastes, thereby reducing the risk to human health and the environment. As part of redevelopment activities, Buildings 190 and 251 (excluding building foundations) have been demolished by the City of Tustin. Therefore, the scope of the removal action will be to minimize or eliminate exposure to the fill soils at Building 190 and its vicinity, and at the hotspot locations at Building 251 by excavating the arsenic-contaminated fill soils.

The removal action at the Arsenic AOC will consist of excavation of arsenic-contaminated fill soil and disposal at an appropriate off-station disposal facility. The selection of the off-site disposal facility will be based on the characterization of the arsenic-contaminated fill soil, and in accordance with the requirements of 40 Code of Federal Regulations (C.F.R.) Section 300.440 (a)(1)(3) and (4). Following excavation of the soil at Building 190, confirmation sampling at the bottom of the excavation will be performed to confirm that the cleanup goals (cleanup to the background arsenic concentration of 17.5 mg/kg in the soil) are attained. At Building 251, only those arsenic concentrations above two times the background level will be excavated. The removal of soil with arsenic concentrations greater than two times the background concentration at Building 251 will lead to site-wide risk that is in the background risk range. If test results indicate a greater area of contamination than initially estimated, additional soil removal and confirmation sampling will be performed until the soil cleanup goals have been attained. Once the confirmatory sampling results indicate that the soil cleanup goals have been met, the excavated areas will be backfilled using clean fill material and compacted.

2.3 EVALUATION AND COMPLIANCE WITH ARARS

Section 300.415(j) of the NCP provides that removal actions must attain applicable or relevant and appropriate requirements (ARARs) to the extent practicable, considering the exigencies of the situation. The federal and state ARARs identified for the removal action at the Arsenic AOC are presented in the following sections. These ARARs are divided into three categories: chemical-

specific, location-specific, and action-specific requirements. The classification was developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another.

2.3.1 Chemical-Specific ARARs

2.3.1.1 FEDERAL CHEMICAL-SPECIFIC ARARs

The preamble to the NCP indicates that state regulations that are components of a federally authorized or delegated state program are generally considered federal requirements and potential federal ARARs for the purposes of ARARs analysis (55 Federal Register [Fed.Reg.] 8666, 8742 [1990]). The state of California received approval for its base RCRA hazardous waste management program on 23 July 1992 (57 Fed. Reg. 32726 [1992]). The state of California "Environmental Health Standards for the Management of Hazardous Waste," set forth in Title 22 California Code of Regulations, Division 4.5 (Cal. Code Regs. tit. 22, div. 4.5), were approved by U.S. Environmental Protection Agency (EPA) as a component of the federally authorized state of California RCRA program. On 26 September 2001, California received final authorization of its revised State Hazardous Waste Management Program by the U.S. EPA (63 Fed. Reg. 49118 [2001]). The regulations of Cal. Code Regs. tit. 22, div. 4.5 are, therefore, a source of potential federal ARARs for CERCLA response actions. The exception is when a state regulation is broader in scope than the corresponding federal RCRA regulations. In that case, such regulations are not considered part of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and potential state ARARs.

The excavated soil generated during the construction phase of the removal action may potentially be a hazardous waste. Therefore, federal regulations for waste characterization including Cal. Code Regs. tit. 22, Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are applicable requirements for determining whether the excavated soil is a RCRA hazardous waste. Table 2-1 lists the chemical-specific ARARs for the proposed removal action alternative at the Arsenic AOC.

2.3.1.2 STATE CHEMICAL-SPECIFIC ARARs

No chemical-specific ARARs were identified, however the following state of California regulations related to the identification of non-RCRA hazardous waste may be relevant to the removal action. These regulations include Cal. Code Regs. tit. 22, Sections 66261.22(a)(3) and (4), 66261.24(a)(2) to (a)(8), 66261.101, 66261.3(a)(2)(C) or 66261.3(a)(2) (F)

2.3.2 Location-Specific ARARs

2.3.2.1 FEDERAL LOCATION-SPECIFIC ARARs

The only resource category that could be potentially affected by the removal action at the Arsenic AOC is biological resources. There is a potential for the existence of plant and animal species protected by the state or federal laws at the site, therefore the regulations relating to protection of these species may be ARARs for the removal action. Table 2-2 presents location-specific ARARs for the removal action at the Arsenic AOC.

Migratory birds such as Cooper's hawk and golden eagle have been identified in the vicinity of the former MCAS Tustin. Therefore, the requirements of the Migratory Bird Treaty Act are relevant and appropriate federal requirements for the removal action if migratory birds are identified at the Arsenic AOC.

Table 2-1: Chemical-Specific ARARs

Requirement	Prerequisite	Citation ^b	ARAR Determination	Comments
FEDERAL^a				
Resource Conservation and Recovery Act (42 United States Code (U.S.C.), chapter (ch.) 82, Sections [§§] 6901–6991[i])^c				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the Toxicity Characteristic Leaching Procedure (TCLP), if the waste exceeds the TCLP maximum concentrations.	Waste	Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	RCRA hazardous waste evaluation for the soil that will be excavated at the Arsenic AOC will be based on these cited regulations.
STATE				
Cal/EPA Department of Toxic Substances Control^d				
Definition of “non-RCRA hazardous waste.”	Waste	Cal. Code Regs. tit. 22, § 66261.22(a)(3) and (4), 66261.24(a)(2)-(a)(8), 66261.101, 66261.3(a)(2)(C) or 66261.3(a)(2)(F)	Relevant	California-regulated, non-RCRA hazardous waste evaluation for the soil that will be excavated at Arsenic AOC will be based on these cited regulations.

Notes:

- ^a Many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables.
- ^b Only the substantive provisions of the requirements cited in this table are potential ARARs.
- ^c Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs.

Table 2-2: Location-Specific ARARs

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
FEDERAL					
Migratory Bird Treaty Act of 1972 (16 U.S.C. §§ 703–712)^b					
Migratory bird area	Protects almost all species of native migratory birds in the U.S. from unregulated “take,” which can include poisoning at hazardous waste sites.	Presence of migratory birds	16 U.S.C. § 703	Relevant and Appropriate	Migratory birds such as Cooper’s hawk and golden eagle have been identified in the vicinity of the former MCAS Tustin. Therefore the requirements of the Migratory Bird Treaty Act are relevant and appropriate if the migratory birds are observed at the Arsenic AOC during the removal action.
STATE					
Cal. Fish & Game Code^b					
Birds of Prey	Prohibits the take, possession, or destruction of any birds in the orders of falconiformes or strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.	Falconiformes or strigiformes (birds-of-prey), or their nest or eggs	Fish and Game code § 3503.5	Applicable	Substantive requirements are applicable if the designated species or their eggs are located onsite during the removal action.
Nongame Birds	Prohibits the take of nongame birds, except in accordance with regulations of the commission, or when related to mining operations with a mitigation plan approved by the department. This section further provides requirements concerning mitigation plans related to mining. This section is applicable and relevant to the extent that nongame birds or their eggs are located on or near the site and such species have not been included in the fish and wildlife conservation plan filed pursuant to the Federal Fish and Wildlife Conservation Act. Species included in the plan will be protected at the federal standard making this section an ARAR to the extent that it is more stringent than the federal standard of protection	Nongame Birds	Fish and Game Code § 3800	Applicable	Substantive requirements are applicable if nongame birds or their eggs are located onsite during the removal action.

Location	Requirement	Prerequisite	Citation ⁿ	ARAR Determination	Comments
Nongame mammals	Nongame mammals are those occurring naturally in California, which are not game mammals, fully protected mammals, or fur-bearing mammals. These mammals, or their parts, may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission. Nongame mammals with potential to occur at the former MCAS Tustin include skunk, opossum, and rodents.	Nongame mammals	Fish and Game Code § 4150	Applicable	Substantive requirements are applicable if the nongame mammals are found onsite during the removal action.
Nongame animals	<p>This regulation provides that nongame birds and mammals may not be taken.</p> <p>a) The following nongame birds and mammals may be taken except as provided in chapter 6: English sparrow, starling, coyote, weasels, skunks, opossum, moles and rodents (excludes tree and flying squirrels, and those listed as furbearers, endangered or threatened species);</p> <p>b) Fallow, sambar, sika, and axis deer may be taken concurrently with the general deer season.</p> <p>c) Aoudad, mouflon, tahr, and feral goats may be taken all year.</p> <p>d) American crows may be taken only under provisions of section 485 and by landowners or tenants, or person authorized by landowners or tenants, when American crows are committing or about to commit depredations upon ornamental shade trees, agricultural crops, livestock, or wildlife, or when concentration in such numbers and manner as to constitute a health hazard or other nuisance. If required by federal regulations, landowners or tenants shall obtain a federal migratory bird depredation permit before taking any American crows or authorizing any other person to take them.</p>	Nongame animals	Title 14 Cal. Code Regs. § 472	Applicable	Substantive requirements are applicable if nongame birds and mammals are present onsite during the removal action.

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Nongame Birds and Nongame Mammals	This regulation provides that birds and nongame mammals may be taken in any manner except as follows: a) Poison may not be used, b) Recorded or electrically amplified bird or mammal calls or sounds or recorded or electrically amplified imitations of bird or mammal calls or sounds may not be used to take any nongame bird or nongame mammal except coyotes, bobcats, American crows and starlings. The regulation further specifies the type of equipment that may be used to trap nongame mammals when take with equipment and ammunition, traps, fee, bait and/or other material capable of attracting nongame mammals may occur.	Nongame Birds and Nongame Mammals	Title 14 Cal. Code Regs. § 475	Applicable	Substantive requirements are relevant if there is need to take any of nongame birds and mammals onsite during removal action.

Note:

^a

Only the substantive provisions of the requirements cited in this table are potential ARARs.

^b

Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs follow each general heading; only substantive requirements of the specific citations are considered potential ARARs.

2.3.2.2 STATE LOCATION-SPECIFIC ARARs

The state location-specific ARARs for the removal action at the Arsenic AOC includes California Fish and Game Code Sections 3503.5, 3800, and 4150, and Cal. Code Regs. tit. 14 Sections 472 and 475. These regulations are ARARs only if the species designated in these regulations are located onsite and may be affected by the removal action at the Arsenic AOC.

2.3.3 Action-Specific ARARs

2.3.3.1 FEDERAL ACTION-SPECIFIC ARARs

Action-specific ARARs are technology- or activity-based requirements or limitations for removal activities. These requirements are triggered by the particular activities conducted at the site. Since the removal action at the Arsenic AOC will lead to generation of waste in the form of excavated soil, federal regulations for RCRA hazardous waste determination for the excavated soil, including Cal. Code Regs. tit. 22, Sections 66262.10(a), 66262.11, and 66264.13(a) and (b) are applicable to the removal action. Table 2-3 presents action-specific ARARs for the removal action at the Arsenic AOC.

2.3.3.2 STATE ACTION-SPECIFIC ARARs

The removal action involves excavation, earth-moving, and grading activities. These activities have a potential to generate fugitive dust; therefore, the requirements of South Coast Air Quality Management District (SCAQMD) Rules 401 and 403 relating to control of visible emissions and fugitive dust are applicable. In addition, the substantive provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharges associated with construction activity, including substantive requirements for development and implementation of best management practices (BMPs), and substantive requirements for the content of a Storm Water Pollution Prevention Plan (SWPPP) are "TBC" (to be considered) requirements for the proposed removal action alternative at the Arsenic AOC.

2.4 EXCAVATION DESIGN

The excavation area design for the removal action at the Arsenic AOC is presented in Figure 2-1. Based on the scope of the removal action and as presented in the EE/CA (Earth Tech 2004) and AM (DON 2004), approximately 4,900 bank cubic yards (bcy) of arsenic-contaminated fill soil will be excavated from the Arsenic AOC from the removal action area shown in Figure 2-1. The excavation will be approximately 1-foot bgs and proceed to a depth of approximately 2.5 feet bgs. Buildings 190 and 251 have been demolished as part of redevelopment activities by the City of Tustin.

Prior to soil excavation, approximately 883 bcy of the existing asphalt cover and 2,364 bcy of hardscape, slabs, and foundations associated with Buildings 190 and 251 (Figure 2-2) shall be removed, and concrete piles shall be removed to the elevation of the bottom of the contaminated soil excavation (Appendix E). At Building 251, foundations associated with the partial canopies (Figure 2-2) surrounding the building will not be removed.

2.5 SOIL PROFILING AND WASTE CHARACTERIZATION

2.5.1 RCRA Hazardous Waste Evaluation

RCRA hazardous waste evaluation for the soil that will be excavated at the Arsenic AOC is summarized below.

2.5.1.1 ASSESSMENT OF TOXICITY

Five soil samples collected during the second round of PA conducted in 2004 (with arsenic concentrations of 42.2, 67.2, 77.4, 92.9, and 105 mg/kg) were composited and analyzed by EPA Method 6010B for arsenic, and EPA TCLP test method 1311. The total arsenic concentration in the composite soil sample was 95.9 mg/kg and arsenic concentration in the TCLP extract was observed to be 0.0191 mg/L. These results along with the below-mentioned observations suggest that the excavated soil from the Arsenic AOC will not exhibit toxicity characteristic of the RCRA hazardous waste:

- The arsenic concentration in the TCLP extract was observed to be less than its stipulated TCLP limit by more than two orders of magnitude.
- The TCLP value of 0.0191 mg/L corresponds to total arsenic concentration of 95.9 mg/kg. It is anticipated that the arsenic-contaminated fill soil will not exceed TCLP limit of 5 mg/L, since the 95 percent upper confidence limit of the mean concentration for Building 190 and its vicinity is 68.5 mg/kg and for Building 251 is 29.5 mg/kg.

2.5.1.2 ASSESSMENT OF IGNITABILITY, REACTIVITY AND CORROSIVITY

Based on the existing knowledge of the nature of contamination at the Arsenic AOC, soil contamination at the Arsenic AOC is not ignitable, corrosive, or reactive. Therefore, excavated soil at the Arsenic AOC will not exhibit ignitability, reactivity, or corrosivity characteristics of RCRA hazardous waste.

2.5.2 California Regulated, Non-RCRA Hazardous Waste

California-regulated, non-RCRA hazardous waste evaluation for the soil that will be excavated at the Arsenic AOC is summarized below:

2.5.2.1 ASSESSMENT OF TOXICITY

Five soil samples collected during the second round of PA conducted in 2004 (with arsenic concentrations of 42.2, 67.2, 77.4, 92.9, and 105 mg/kg) were composited and analyzed by EPA method 6010B for arsenic, and waste extraction test (WET). The total arsenic concentration in the composite soil sample was observed to be 95.9 mg/kg and arsenic concentration in the WET extract was 1.4 mg/L. These results along with the below-mentioned observations suggest that the excavated soil from the Arsenic AOC will not exhibit toxicity characteristic of the California-regulated non-RCRA hazardous waste:

- The arsenic concentration in the WET extract was less than the soluble threshold limit concentration (STLC) of 5 mg/L.
- The STLC value of 1.4 mg/L corresponds to total arsenic concentration of 95.9 mg/kg. It is anticipated that the arsenic-contaminated fill soil will not exceed STLC limit of 5 mg/L, since the 95 percent upper confidence limit of the mean concentration for Building 190 and its vicinity is 68.5 mg/kg and for Building 251 is 29.5 mg/kg.
- In addition, the total arsenic concentrations are also less than the total threshold limit concentration of 500 mg/L.

2.5.2.2 ASSESSMENT OF IGNITABILITY, REACTIVITY AND CORROSIVITY

Based on the existing knowledge of the nature of contamination at the Arsenic AOC, soil contamination at the Arsenic AOC is not ignitable, corrosive, or reactive. Therefore, excavated soil at the Arsenic AOC will not exhibit ignitability, reactivity, or corrosivity characteristics of California-regulated, non-RCRA hazardous waste.

Table 2-3: Action-Specific ARARs

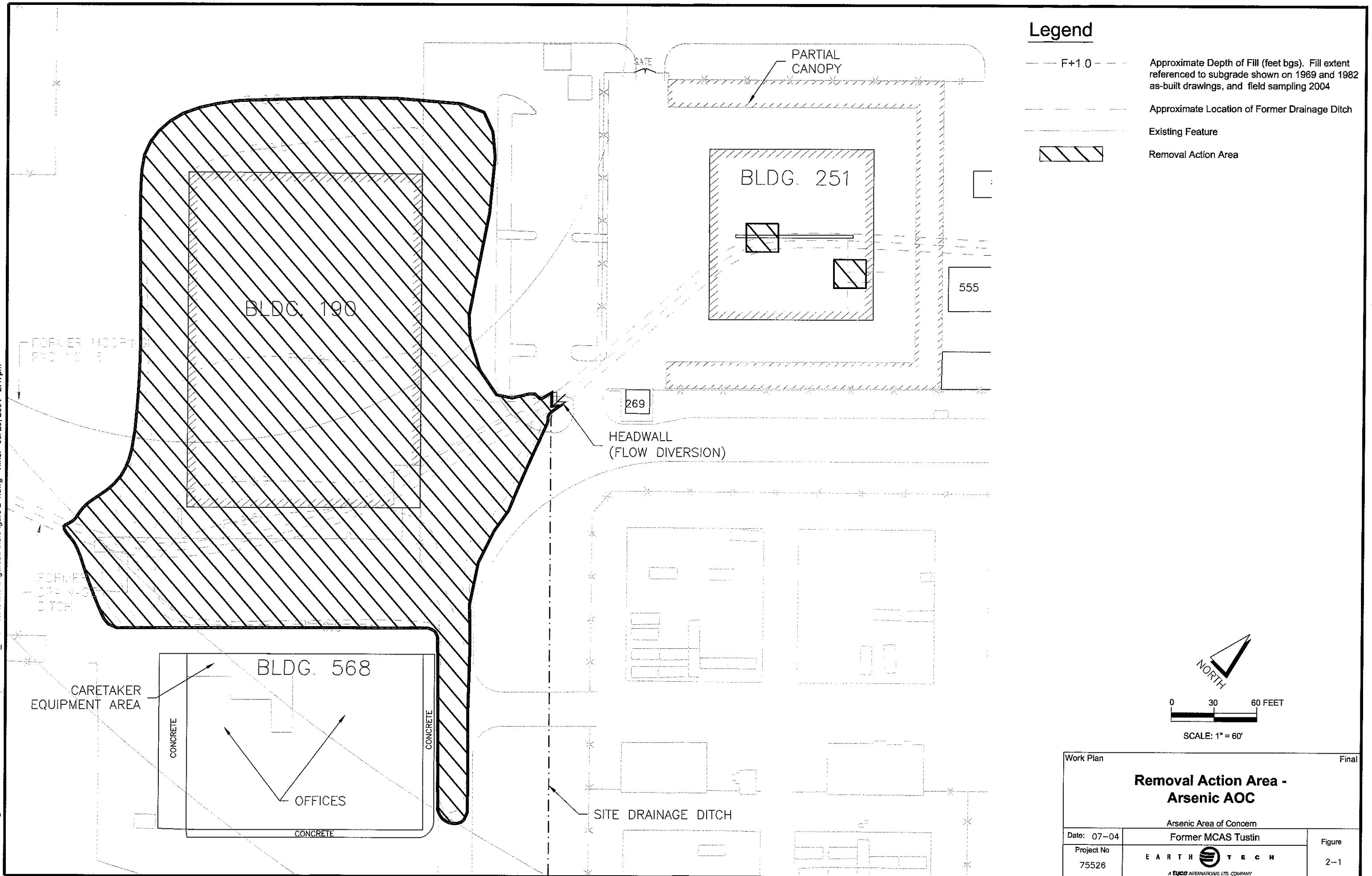
Action	Requirement	Prerequisites	Citation	ARAR Determination	Comments
FEDERAL					
Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991(j))*					
On-site waste generation	Person who generates waste shall determine if that waste is a hazardous waste.	Generator of waste	Cal. Code Regs. tit. 22, § 66262.10(a), 66262.11	Applicable	RCRA hazardous waste determination for the excavated soil from the Arsenic AOC was performed using the soil samples collected as a part of PA 2004 soil sampling.
	Requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste	Cal. Code Regs. tit. 22, § 66264.13(a) and (b)	Applicable	Analyses was performed on the soil samples collected as a part of PA 2004 to determine if the waste exhibits the characteristics of the RCRA hazardous waste.
STATE					
Air Quality Management District/Air Pollution Control District*					
Discharge of air emissions	Visible emissions standard that states a person shall not discharge any air contaminant into the atmosphere from any single source of emission for a period or periods aggregating more than 3 minutes in a 60-minute period, which is (a) as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, or (b) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in (a).		SCAQMD Rule 401	Applicable	Excavation, construction, and earthmoving activities have the potential to produce visible emissions due to fugitive dust. Visible emissions due to fugitive dust will be prevented by measures such as wetting the soil.
Discharge of fugitive dust	Shall not cause or allow the emissions of fugitive dust such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source and shall not cause or allow particulate matter less than 10 micrometers in diameter (PM ₁₀) levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples.		SCAQMD Rule 403	Applicable	The excavation area at the Arsenic AOC is less than 100 acres, and the construction operations do not constitute movements of greater than 10,000 cy more than 3 times a year. Therefore, particulate monitoring will not be conducted at Arsenic AOC. However, measures to prevent fugitive dust such as wetting the soil will be implemented.

Action	Requirement	Prerequisites	Citation	ARAR Determination	Comments
Storm water discharges	Construction and earth-moving activities that result in disturbance of at least one acre are subject to Water Quality Order No. 99-08-DWQ and the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit). Such activities include, but are not limited to, clearing, grading, stockpiling and excavation of soil or other materials.	Construction activity that results in disturbance of at least one acre	NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit)	To be considered	Since the removal action will result in disturbance of at least one acre, the state of California identified Water Quality Order No. 99-08-DWQ and the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) as potential ARARs. The DON has determined that Section 121 (e)(1) of CERCLA and the corresponding provision in the NCP (40 C.F.R. Section 300.400[e][1]) apply to the discharge of storm water from the removal action area at the Arsenic AOC and that an NPDES permit (either general or individual) is not required for that discharge. However, DON will comply with the substantive provisions of the NPDES General Permit identified by the state of California, as "TBC" guidance for compliance with the federal Clean Water Act and state of California water quality requirements including substantive requirements for development and implementation of BMPs and substantive requirements for the content of a SWPPP. Compliance with these substantive requirements has been documented in Appendix D titled "Storm Water Management Plan." This plan includes descriptions of the BMPs to be implemented during the removal action and address substantive SWPPP content requirements.

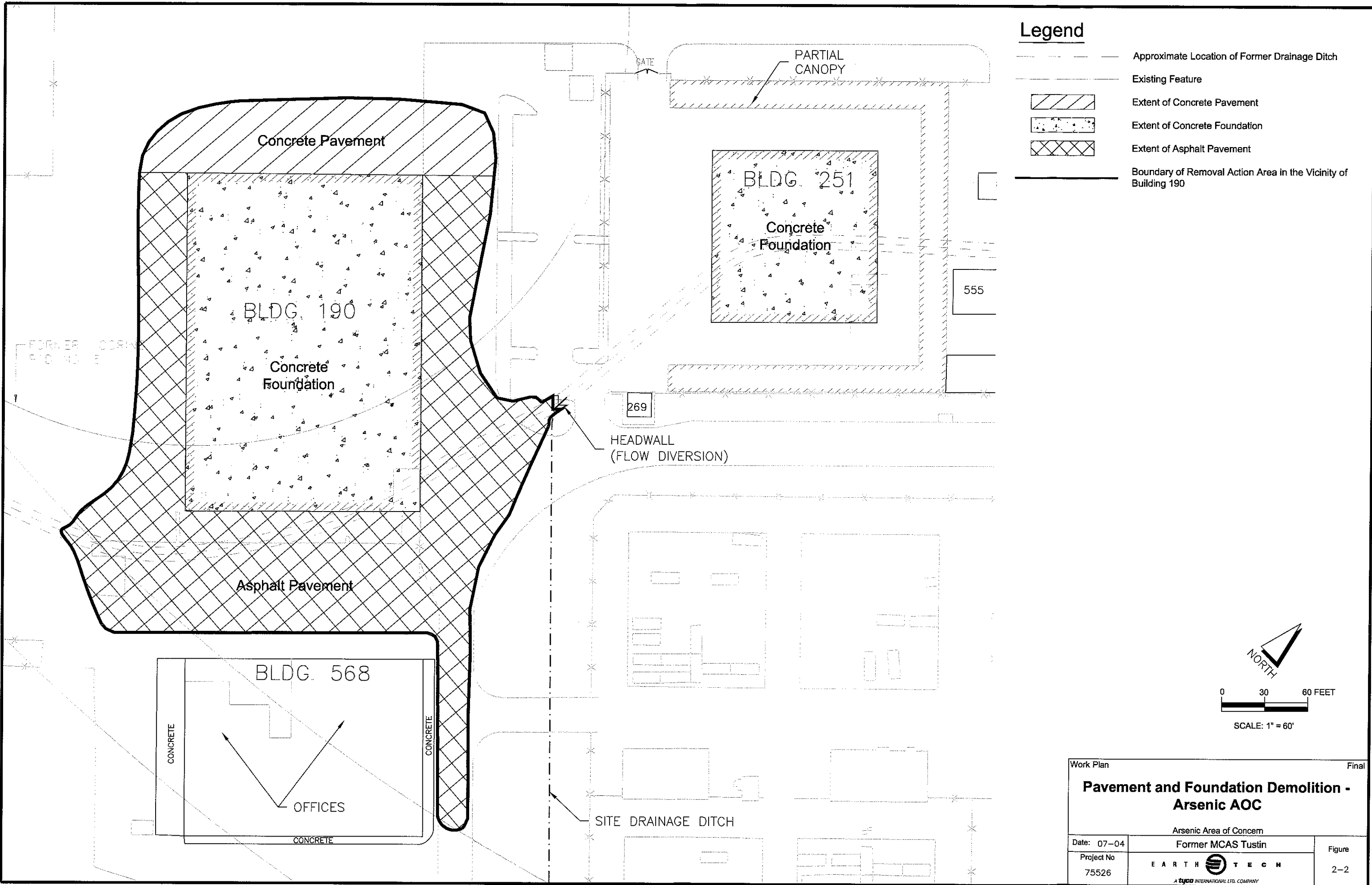
Note:


* statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific actions are considered potential ARARs.

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Work Plan		Final
Pavement and Foundation Demolition - Arsenic AOC		
Arsenic Area of Concern		
Date: 07-04	Former MCAS Tustin	Figure 2-2
Project No 75526	<div>EARTHTECH</div> <div>A tyco INTERNATIONAL LTD. COMPANY</div>	

2.6 CHARACTERIZATION OF THE BACKFILL MATERIAL

The soil used to backfill the excavated areas of the Arsenic AOC will be obtained from an off-Station source. The sampling strategy for backfill source evaluation is based on the recommendations provided in the Department of Toxic Substances Control (DTSC) fact sheet entitled, "Information Advisory, Clean Imported Fill Material" (DTSC 2001). The data quality objectives for the backfill source evaluation are presented in Section 1.2 of the Sampling and Analysis Plan (Appendix A).

Assuming fill material is sampled from the borrow area with stockpile volume of greater than 5,000 cubic yards (cy) and approximately 10,600 cy is required for backfilling the Arsenic AOC, eighteen discrete samples will be collected for the assessment of fill source area. All the samples collected for the backfill source evaluation may be analyzed for the following constituents by the indicated method based on the characterization of the borrow source:

- Volatile organic compounds (EPA SW-846 Method 8260B),
- Semi-volatile organic compounds (EPA SW-846 Method 8270C),
- Total petroleum hydrocarbons (EPA SW-846 Method 8015B),
- Pesticides (EPA SW-846 Method 8081A),
- Herbicides (EPA SW-846 Method 8151),
- Polychlorinated biphenyl (EPA SW-846 Method 8082),
- Metals (EPA SW-846 Method 6010B).

Since the number of samples for fill source assessment were estimated based on assumptions regarding the stockpile volume at the borrow area and the volume of backfill material required, this number may change during the implementation of removal action at the Arsenic AOC, if the above-mentioned assumptions are not valid.

2.7 CONFIRMATORY SAMPLING DESIGN

Following excavation of the soil as described in Section 2.4, soil sampling will be conducted at the Arsenic AOC to confirm that the arsenic-contaminated fill soil exceeding the target cleanup goal (17.5 mg/kg at Building 190 and its vicinity, and 35 mg/kg at the hotspot locations at Building 251) for arsenic has been removed, and the residual risk at the site is within the background risk range. The sampling design for this sampling was developed using the data quality objectives process (EPA 2000) summarized in Appendix A.

The sampling strategy selected for confirmation sampling at the Arsenic AOC consists of discrete sampling. The number of samples at Building 190 and its vicinity was calculated using Visual Sample Plan Software (Pacific Northwest National Laboratory, Version 2.2) based on assumptions, which have been discussed in Appendix A. The decision on the number of samples at the hotspot locations at Building 251 was based on judgment.

The discrete samples will be collected using systematic and grid sampling with random start location. Systematic and grid sampling will ensure complete coverage of the site and provides a practical and easy method for designating sample locations. Based on the sampling design, the decision rules for evaluating the cleanup at the Arsenic AOC, are summarized in Figure 2-3.

In accordance with systematic and grid sampling design, the site was divided into a rectangular grid of 170 feet by 120 feet cells (see Figure 2-4). At Building 190 and its vicinity, nine discrete samples

will be collected from the bottom or sidewalls of the excavation. In addition, up to ten additional sidewall samples may be collected in consultation with the regulatory agencies to confirm that the arsenic-contaminated fill soils have been removed, if the contact between the native and the fill soil is not discernible. At Building 251, two discrete samples will be collected from the bottom of the excavation, and a discrete sample will be collected from each sidewall at the two hotspot locations. The discrete samples will be analyzed and the analytical results of each sample will be compared with target cleanup goals for arsenic.

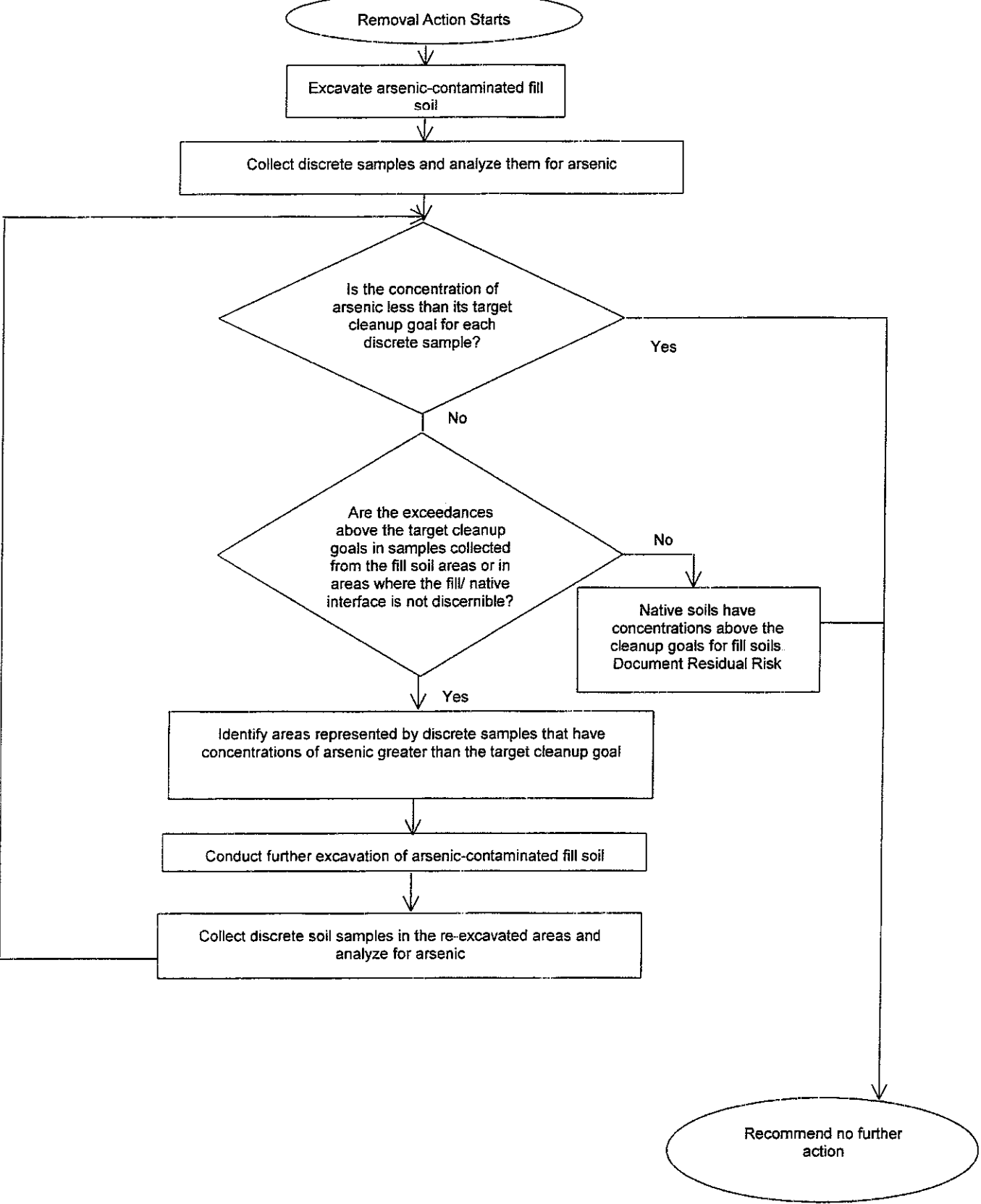
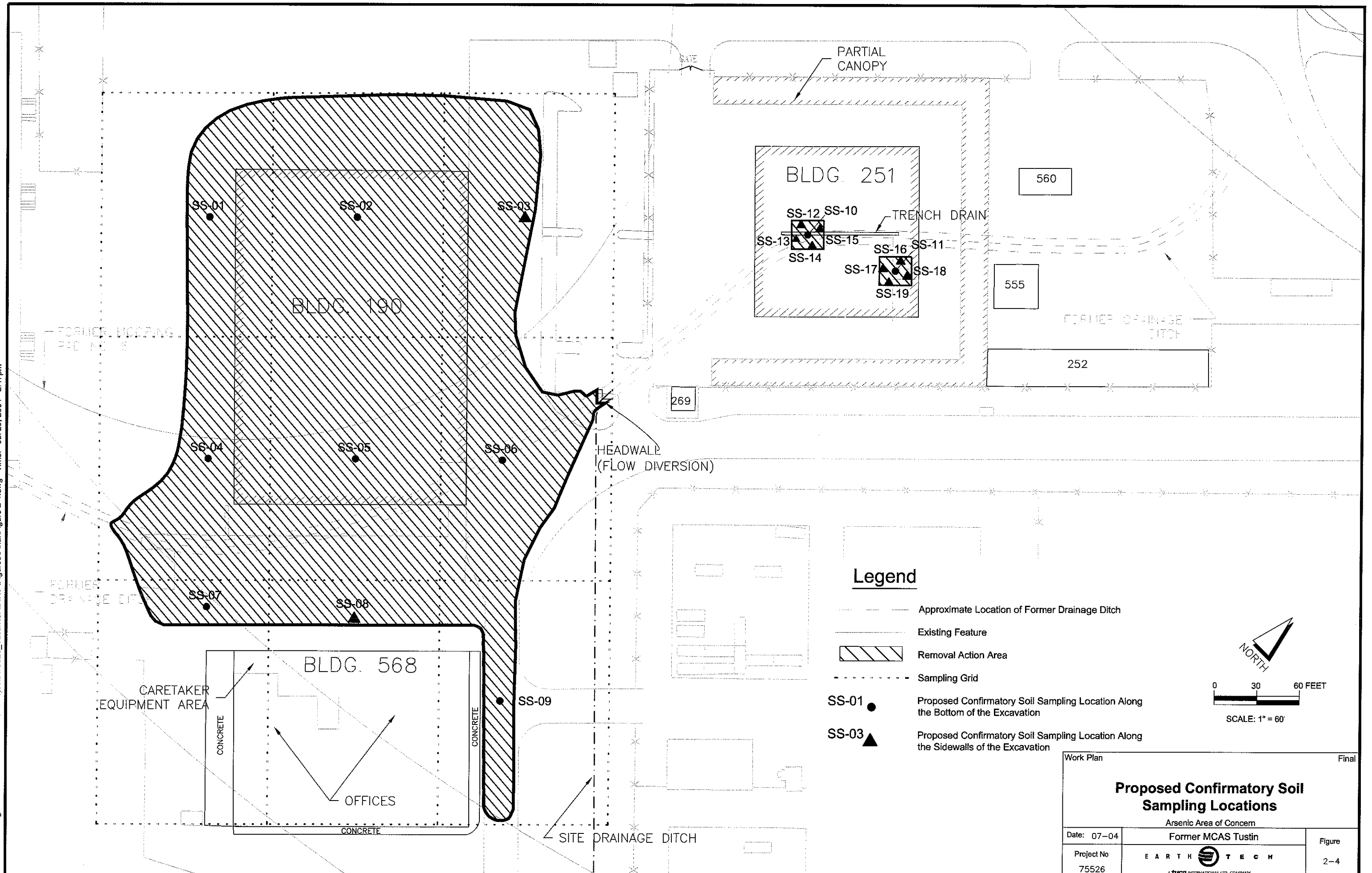


Figure 2-3: Decision Rules for Confirmation Sampling

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3. REMOVAL ACTION IMPLEMENTATION

3.1 PROJECT ORGANIZATION AND KEY PERSONNEL RESPONSIBILITIES

The project organization for removal action implementation at the Arsenic AOC includes representatives from the DON, the BCT, the removal action (RA) contractor, and the QA Manager. The responsibilities of key personnel within each of these organizations are discussed below. The overall organization and relationships of these individuals are illustrated on Figure 3-1.

3.1.1 NFECSW SDIEGO Representatives

The positions and responsibilities of NFECSW SDIEGO representatives are as follows:

- **Contracting Officer.** The Contracting Officer (CO) is responsible for the negotiation and execution of the construction contract. The CO is responsible for providing technical direction to the construction contractor.
- **Remedial Project Manager.** The Remedial Project Manager (RPM) is responsible for all activities that take place at the various sites within MCAS Tustin. Specific tasks include reviewing recommendations made by the Accord Team, including reviewing proposed changes to the technical approach, and overseeing the overall implementation of the removal action.
- **Resident Officer in Charge of Construction.** The Resident Officer in Charge of Construction (ROICC) supports the RPM in coordination of all the work that takes place at MCAS Tustin. Specific tasks include reviewing vendor submittals and personnel qualifications, conducting constructability reviews, and overseeing construction.
- **Quality Assurance Officer.** The Quality Assurance Officer (QAO) is responsible for government oversight of the QA program and provides quality-related direction for the project. The QAO has the authority to suspend project or site activities if NFECSW SDIEGO-approved quality requirements are not adequately followed.

3.1.2 BRAC Cleanup Team

The positions and responsibilities of BRAC Cleanup Team (BCT) personnel are as follows:

- **BRAC Environmental Coordinator (BEC).** The BEC is the NFECSW SDIEGO representative who chairs the BCT and is responsible for coordinating environmental restoration and compliance programs and updating the BRAC Cleanup Plan at MCAS Tustin.
- **U.S. EPA RPM, Cal-EPA (California Environmental Protection Agency) RPMs [i.e., DTSC RPM, and Regional Water Quality Control Board (RWQCB), Santa Ana Region RPM].** These agency RPMs are responsible for overseeing and monitoring the progress of RA and conformance of these activities with the requirements of the federal facilities site remediation agreement.

3.1.3 Accord Team

The position and responsibilities of key Accord Team members are as follows:

- **Program Manager.** The Program Manager is responsible for all aspects of the removal action program.

- **Project Manager.** The Project Manager has overall responsibility for all construction work performed during implementation of the RA. Responsibilities include project planning, scheduling, staffing, execution of tasks and subcontracts, and managing deliverables.
- **QC Manager.** The QC Manager is responsible for developing the QC process to ensure compliance with the project-specific procedures and requirements provided in the RA contract, RA Work Plan, and statements of work developed by the Accord Team. The QC Manager will be independent of cost, scheduling, and other performance constraints that are the responsibility of the Project Manager. The construction QC Manager shall be a registered Civil Engineer in the state of California.
- **Health and Safety Manager.** The Health and Safety Manager is responsible for developing and implementing the program health and safety plan and project specific modifications and amendments.
- **Contracts/Procurement Manager.** The Contracts Manager is responsible for soliciting, selecting, and managing subcontracts for RA construction services and materials required for the project.
- **HSO.** The Project Health and Safety Officer (HSO) is responsible for establishing and maintaining communications with all site personnel concerning the project-specific health and safety plan, verifying adherence to site safety requirements, organizing and conducting safety meetings (tailgate meetings), and recording and documenting safety incidents on site.
- **Project QC Engineer.** The Project Quality Control (QC) Engineer is responsible for ensuring that subcontractors and vendors comply with project requirements and contractual obligations and that all field activities are performed as required by the project design. The QC Engineer will have completed the course entitled, "Construction Quality Management for Contractors" offered by the U.S. Army Corps of Engineers. The QC Engineer will report to the QC Manager on quality matters.
- **Project Engineer.** The Project Engineer assists the Site Superintendent and the Project Manager by reviewing engineering design documents and interfacing with engineering design personnel and field operations to communicate job requirements.
- **Site Superintendent.** The Site Superintendent is responsible for day-to-day supervision of staff and coordination of tasks for project completion. This includes review of engineering design documents, planning and oversight of field activities, and QC.
- **Project Chemist.** The Project Chemist is responsible for ensuring that the field sampling and laboratory analyses are performed in accordance with laboratory and field sampling procedures identified in the field sampling plan and quality assurance project plan of the RA Work Plan. The Project Chemist is a qualified and trained person who reports to the QC Manager on quality matters.
- **Field, Technical, and Health and Safety Staff.** Technical staff will perform QC activities, including subcontractor observation, sampling, testing, and documentation during the RA implementation. Health and safety personnel will develop and implement the site-specific health and safety plan. Subcontractor field personnel will perform construction activities at the site.

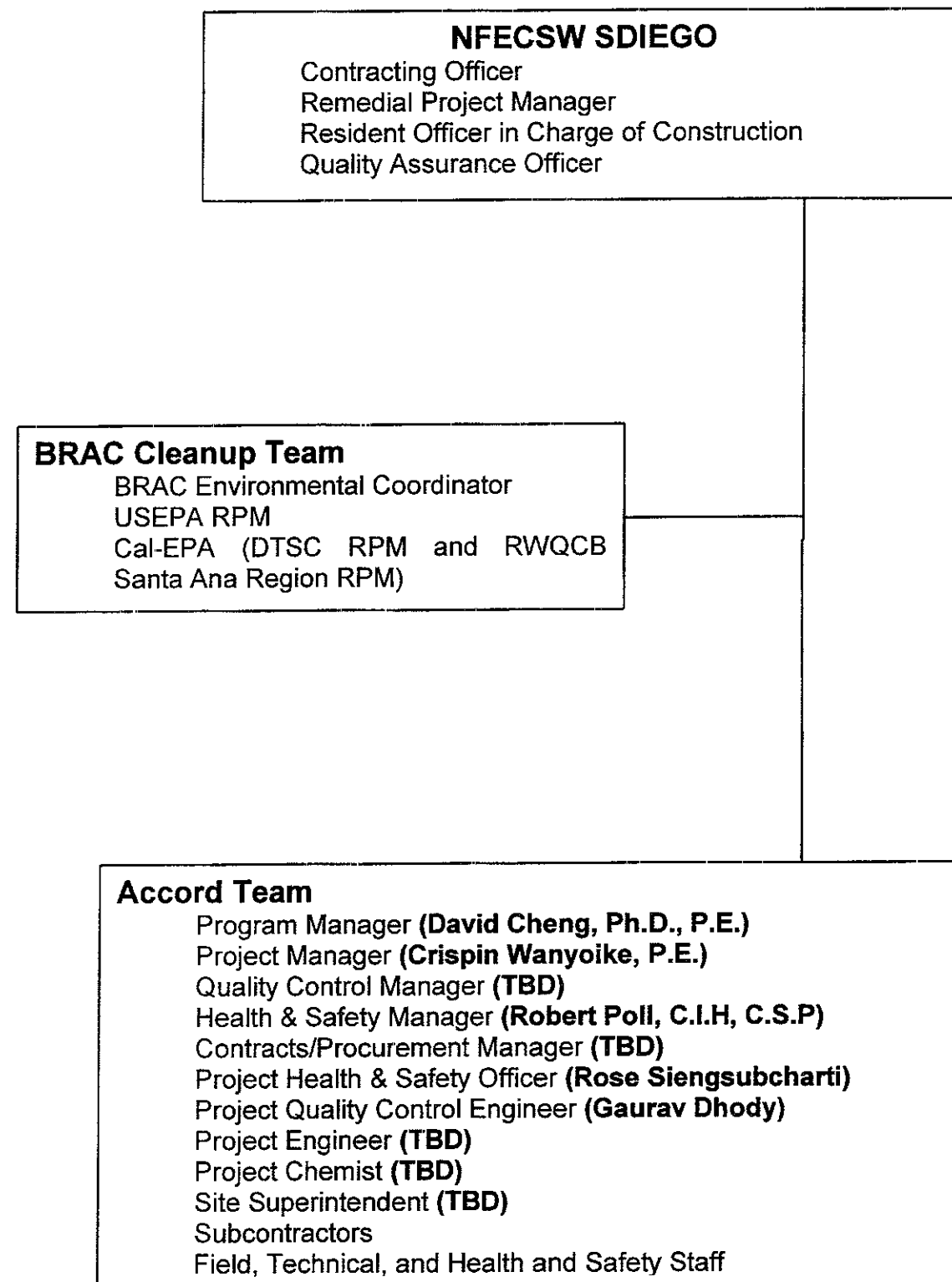


Figure 3-1: Project Organization

3.2 REMOVAL ACTION AT THE ARSENIC AOC

The RA will be implemented at the Arsenic AOC in accordance with the design specifications. Some of the activities that will be performed as a part of implementation of the RA are provided below:

1. Site preparation,
2. Mobilization of excavation equipment on-site,
3. Demolition,
4. Soil excavation,
5. Soil profiling and waste characterization,
6. Transporting excavated soil to an appropriate off-station disposal facility,
7. Confirmation sampling,
8. Characterizing backfill material, and
9. Backfilling and site restoration.

3.3 SITE PREPARATION

Before the excavation is implemented at the Arsenic AOC, certain tasks will be performed to prepare the removal action areas. These tasks will include obtaining utility clearance, setting up temporary structures for site security, traffic control, erosion control, and setting up the decontamination area.

3.3.1 Utility Clearance

Utility clearance will be obtained prior to excavation at the Arsenic AOC by coordinating with the City of Tustin. Underground utilities in the excavation areas will be located by evaluating records including available site plans, utility layouts, as-built drawings, and the results of any previous subsurface investigations. In addition, a nonintrusive geophysical survey will be conducted using magnetic and electromagnetic methods to locate any subsurface utilities. Using the results of the above investigations, the location of utility lines will be marked on a detailed site map and at the site. Following this, the Utility Clearance Request Form (Appendix F), along with the map of the project site that shows the locations of the utility lines, and geophysical survey reports, will be submitted for City of Tustin concurrence and signature at least two weeks prior to the planned excavation start date.

Preliminary review of the utility layouts at the Arsenic AOC indicates that a natural gas line, electrical line, sanitary sewer line, water line, surface drain line, and fire hydrant are located within the boundary of the excavation area at the Arsenic AOC (Figure 3-2). All the utilities within the excavation area will be terminated/abandoned during the implementation of the removal action. Where necessary and as required by the City of Tustin, the terminated/abandoned utilities will be restored.

3.3.2 Site Security and Traffic Control

The existing fence at the Arsenic AOC will be relocated to encompass the removal action area and prevent any unauthorized access to the site during removal action. If needed, additional fencing shall be provided at the Arsenic AOC. In order to control the traffic on the roads in the vicinity of the site and to provide safe working areas, temporary barricades and/or yellow caution tape will be placed, if necessary.

Fencing will be locked and secured when site personnel are not present. Appropriate warning signs such as "No Smoking" and "Hardhat Required" will be placed along the exterior and interior of the fencing as required by the Occupational Health and Safety Administration. In addition, temporary barriers (where necessary) and signs will be erected to prevent unauthorized access to the site.

3.3.3 Erosion and Storm Water Control

The implementation of the removal action at the Arsenic AOC includes excavation, backfilling, and grading activities that will lead to disturbance of areas greater than one acre. Therefore, the substantive provisions of the NPDES General Permit for storm water discharges associated with construction activity, including substantive requirements for development and implementation of BMPs, and substantive requirements for the content of a SWPPP are TBC requirements for this alternative. To comply with these substantive requirements:

- A Storm Water Management Plan (SWMP) has been prepared and attached as Appendix D to the Work Plan
- A Notice of Intent has been completed and included in Appendix D to the Work Plan, and
- The BMPs specified in the SWMP will be implemented, inspected and maintained during the removal action at the Arsenic AOC to minimize storm water pollution and nonstorm water discharges.

A Notice of Termination will be completed when the removal action construction is complete and included in the Closure Report that is prepared to document that the response actions have been conducted as specified in the approved work plan.

3.3.4 Decontamination Area

Personnel and equipment decontamination stations outside the exclusion zone will be established prior to the start of field activities to minimize potential spread of contamination from the contaminated work areas. The exclusion zone will be clearly marked as part of site preparation.

The decontamination area will be used for both dry decontamination of equipment and decontamination using a high-pressure steam washer.

3.3.5 Layout of Excavation Area

Prior to soil excavation, the excavation area will be marked on the existing asphalt or concrete with paint to facilitate implementation of excavation at the site.

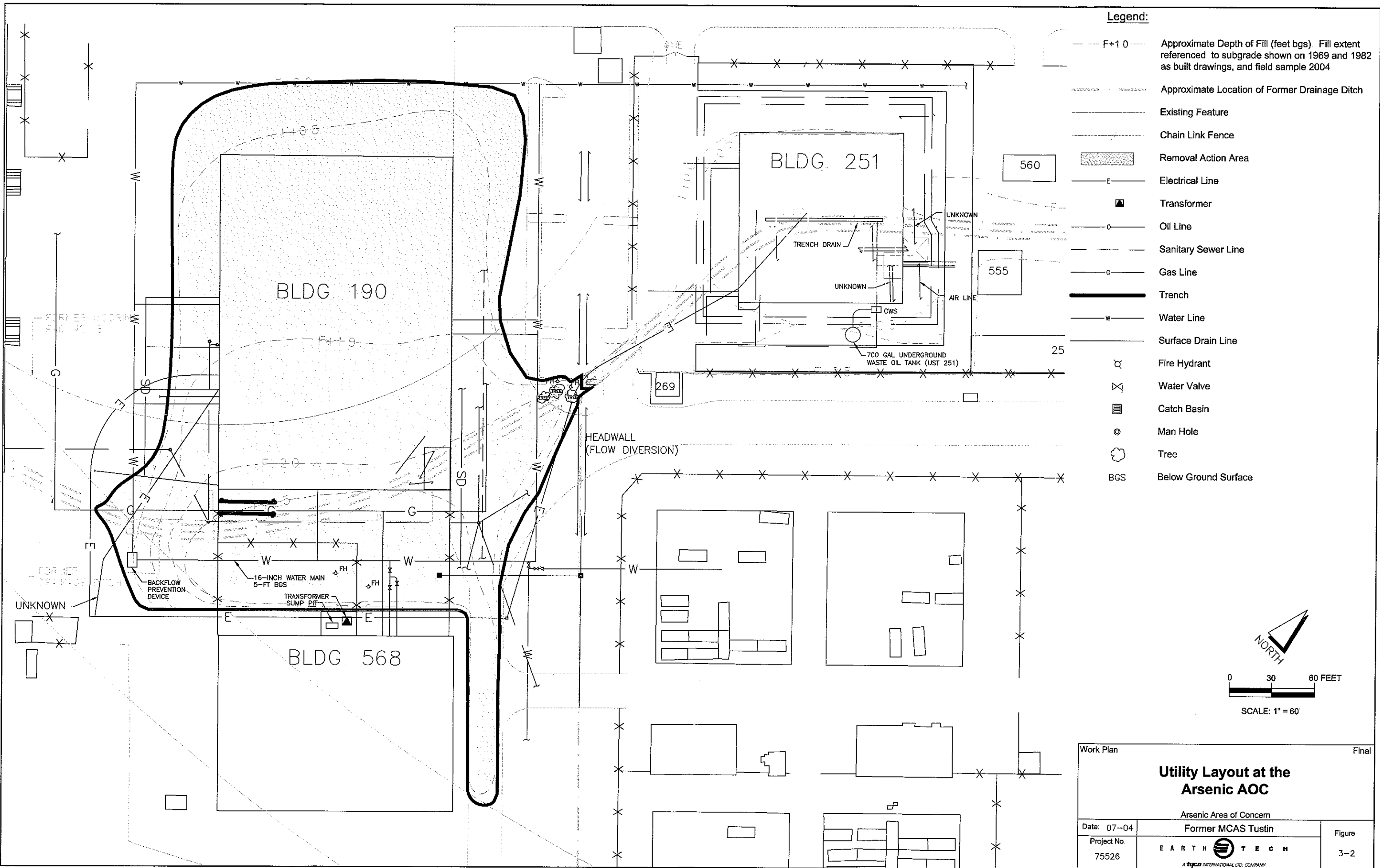
3.4 MOBILIZATION OF EXCAVATION EQUIPMENT

All necessary personnel, equipment, and materials will be mobilized to the site after site preparation. The equipment and materials will include the following:

- Excavation equipment such as backhoe,
- Soil loading equipment such as front-end loader,
- Soil compaction equipment, and
- Trucks for transporting soil and debris from the site

Additional equipment not listed above may be used during the project on an as-needed basis. The Accord Team will make sure that the equipment selected has adequate capability and capacity to perform the designated tasks

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3.5 DEMOLITION

The existing asphalt cover (approximately 883 bcy) and concrete cover (approximately 2,364 bcy) associated with Building 190 and its vicinity, and Building 251 at the Arsenic AOC will be demolished (Figure 2-2). The concrete piles will be removed to the elevation of the bottom of the contaminated soil excavation (Appendix E). At Building 251, foundations associated with the partial canopies surrounding the building will not be removed (Figure 2-2). The asphalt and concrete will be broken down so that no piece exceeds 12 inches in any dimension. The demolished materials will be transported and disposed of as nonhazardous waste or recycled.

3.6 SOIL EXCAVATION

The proposed lateral and vertical limits of soil excavation at Arsenic AOC are shown in Figure 2-1. Conventional excavation equipment such as front-end loaders, backhoes, and excavators will be used to remove the soil. The excavator will be fitted with a smooth bucket to allow for controlled soil removal.

Buildings 190 and 251 have been demolished by the City of Tustin as a part of the redevelopment activities. The excavated soil (4,900 bcy) will be temporarily mounded within the excavation footprint and will be loaded into trucks for transportation to an approved disposal facility. The BMPs associated with excavation footprint will prevent runoff from the site.

Before the excavated areas are backfilled, confirmatory samples will be collected from the sidewalls and bottom of the excavated areas in accordance with the confirmatory sampling design plan shown in Figure 2-4. These samples will be analyzed on a rush turnaround schedule (24 hours). If the confirmatory sampling results indicate that the contaminated soil exceeding the target cleanup goals has been removed from the site in accordance with the decision rules described in Section 1.1.5 of Appendix A, the excavated areas will be backfilled and the site will be restored as described in Section 3.11. If the confirmatory sampling results show that cleanup has not been achieved in accordance with the decision rules described in Section 1.1.5 of Appendix A, further excavation and additional soil sampling will be conducted.

3.7 EXCAVATED SOIL PROFILING AND CHARACTERIZATION

The details of the RCRA hazardous waste and California-regulated, non-RCRA hazardous waste evaluation for the excavated soil from the Arsenic AOC are presented in Section 2.5. This evaluation indicates that the excavated soil from the Arsenic AOC will neither exhibit the characteristics of RCRA hazardous waste nor the characteristics of California-regulated, non-RCRA hazardous waste. A waste profile has been completed based on these results and submitted to off-Station disposal facilities. If the disposal facilities require additional data for characterization of the excavated soil, additional soil samples will be collected and analyzed.

3.8 TRANSPORTATION OF EXCAVATED SOIL TO OFF-STATION DISPOSAL FACILITY

The excavated soil will be loaded into trucks for transportation to an approved disposal facility using a skip loader, a wheel loader, or a track excavator. During loading, the trucks will remain on clean areas to minimize the need to decontaminate the truck tires.

3.8.1 Transportation Plan

The excavated soil from the Arsenic AOC will be transported to an appropriate off-site disposal facility. The transportation route that will be followed by the trucks within the former MCAS Tustin

for transportation of contaminated soil is shown on Figure 3-3. If an alternative route is proposed, the City of Tustin will be contacted for concurrence prior to beginning the removal action.

Transportation activities will comply with the applicable regulations. The transportation company(ies) will be certified by the EPA and the state of California as permitted hazardous waste haulers. Each trucking contractor will have the necessary licenses and permits to transport the excavated soil to the disposal facility. The transporter will be required to have the following valid certification information:

- Certificate of insurance,
- Hazardous Substances Removal and RA Certification,
- Hazardous waste transporter registration,
- California Highway Patrol transporter license,
- EPA transporter number, and
- U.S. Department of Transportation transporter number.

The loading of transport trucks will include generation of the bill of lading (if the waste is nonhazardous) or hazardous waste manifest (if the waste is hazardous). The bill of lading will document the date, loading location, disposal location, and approximate weight of the materials shipped. The hazardous waste manifest will contain the generator, transporter and treatment facility EPA identification number, the generator address, the responsible individual, estimated quantity of material to be disposed of, and EPA waste code. These documents will provide the transporter with the documentation needed for transport, and provide the Accord Team with the weights of the materials shipped from the site and means to track the waste.

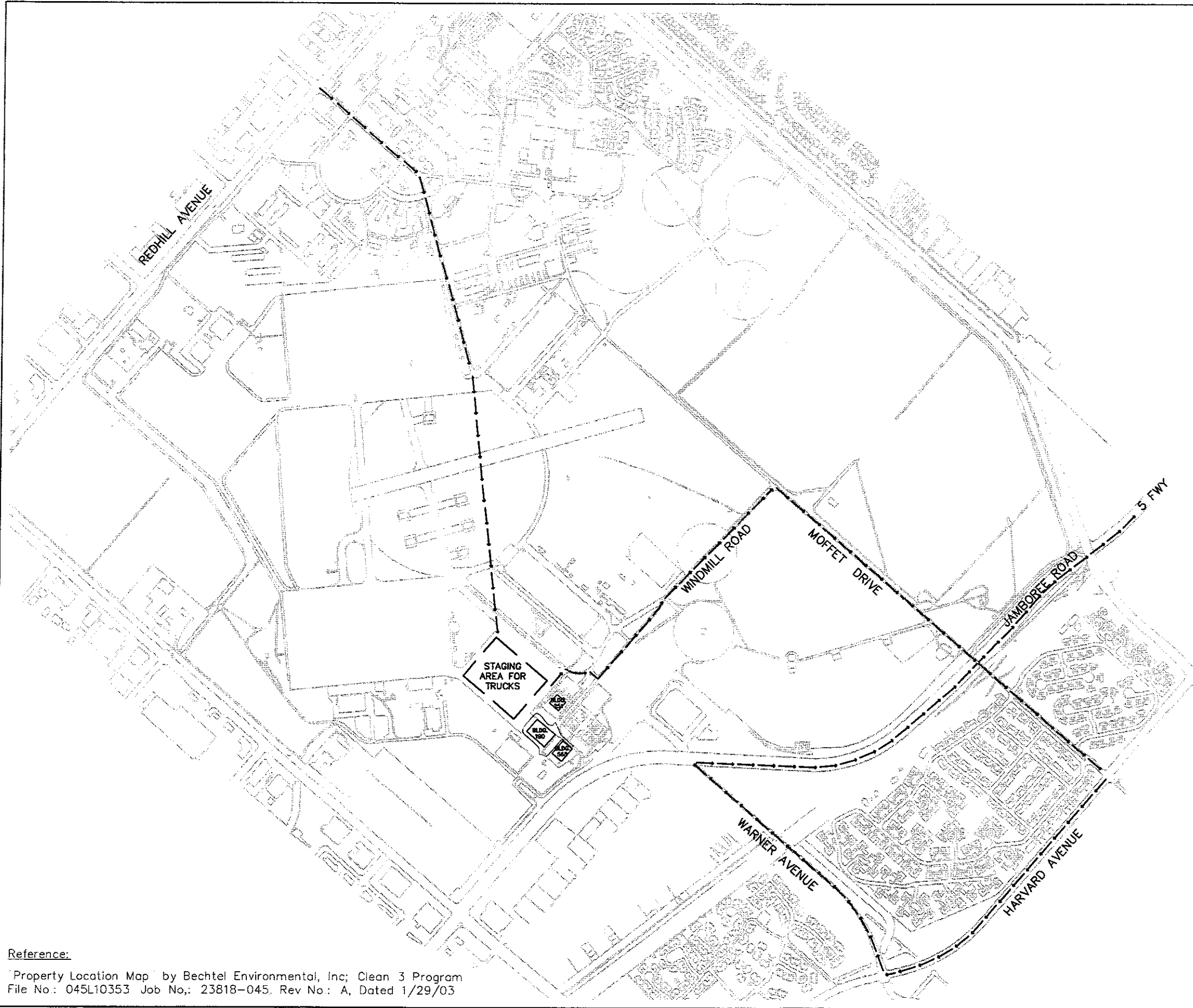
The weight of the loaded trucks will be estimated using the axle gauges on each truck. The loaded trucks will be covered with a tarp and will travel to the final destination where actual weight will be estimated using certified scales. Prior to leaving the load-out area, the tires and sides of the truck will be inspected for loose soil debris. Any extra soil will be removed using a wire brush or broom.

Each load will be inspected by the Accord Team, and a load inspection report completed upon load approval. The Accord Team will stay in contact with the transporter and the disposal facility to ensure that manifests and destruction certificates are forwarded to the DON within the mandated reporting period.



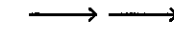

3.9 CONFIRMATION SAMPLING

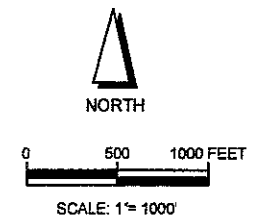
Following excavation, confirmation sampling will be conducted in the excavation areas to verify that the contaminated soil exceeding the target cleanup goals for arsenic has been removed. As shown in Figure 2-4, nine discrete samples will be collected from the sidewalls and bottom of excavation at Building 190 and its vicinity, and ten discrete samples will be collected from the hotspot locations at Building 251. In addition, up to ten additional sidewall samples may be collected at Building 190 and its vicinity in consultation with the regulatory agencies to confirm that the arsenic-contaminated fill soils have been removed, if the contact between the native and the fill is not discernible. The discrete samples submitted to the laboratory will be rush analyzed. If the results indicate that the

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LEGEND:

-  ROAD
-  BUILDING OR STRUCTURE
-  DIRECTION OF TRAFFIC FLOW
-  BOUNDARY OF REMOVAL ACTION AREA IN THE VICINITY OF BUILDING 190



Reference:

'Property Location Map' by Bechtel Environmental, Inc; Clean 3 Program
File No.: 045L10353 Job No.: 23818-045. Rev No.: A, Dated 1/29/03

Work Plan		Final	
Traffic Route Plan			
Arsenic Area of Concern			
Date: 07-04		Former MCAS Tustin	
Project No 75526	<div>EARTHTECH</div> <div>A tyco INTERNATIONAL LTD. COMPANY</div>		Figure 3-3

target cleanup goals for arsenic have been attained, the area will be backfilled. If the analysis of the data obtained from the confirmation sampling indicates that the contaminated soil has been removed in accordance with decision rules described in Section 1.1.5 of Appendix A, the excavated areas will be backfilled. However, additional rounds of excavation and confirmatory sampling may have to be conducted, if the data from the first round of confirmatory sampling indicates that cleanup has not been attained at the site.

3.10 CHARACTERIZATION OF THE BACKFILL MATERIAL

Backfill material will be characterized as described in Section 2.6

3.11 BACKFILLING AND SITE RESTORATION

After it has been confirmed, using the decision rules described in Section 1.1.5 of Appendix A, that the contaminated fill soil exceeding the target cleanup goals for arsenic has been removed, and concurrence of regulatory agencies on the achievement of the cleanup levels at the site has been obtained, backfill operations will begin. Backfill will be obtained from an off-Station source and will belong to groups SM, SC, or ML in accordance with the Unified Soil Classification System (American Society For Testing and Materials [ASTM] Standard D 2487).

The compaction will be performed with equipment such as rolling drum compactors, sheepsfoot rollers, excavator/backhoe compaction wheel attached to the boom, and vibratory compactors, or other equipment capable of attaining the required density throughout the soil layer. The areas not accessible to heavy equipment may be compacted with hand tampers.

The fill material will be characterized before backfilling as described in Section 2.6, and backfilling will be performed under the supervision of a Civil Engineer to restore the site to original grading and drainage conditions.

Before placing the fill material, it will be confirmed that loose soil has been removed, and a firm base exists at the bottom of the excavation to support the fill material. The fill will be compacted to 90 percent of ASTM D 1557 maximum dry density. The moisture content of the fill material at the time of compaction will be within three percent of the optimum moisture content. If the moisture content of a layer of fill material is below the relative optimum before compaction, the required amount of water will be uniformly applied to the surface of the layer of soil material, which will then be mixed until a uniform moisture content is reached. The layer will be dried if the moisture content of the backfill material is above the relative optimum, and is observed to be "pumping."

The backfilling operations will be monitored for: (1) moisture conditioning of soil during processing, placement, and compaction, (2) compactive effort, (3) equipment types and weights, (4) maximum clod size, (5) lift thickness (loose and compacted), and (6) methods used for lift bonding. Field testing, if necessary, shall include but not be limited to, the following: (1) field moisture content ASTM (D2216 or D3017) and (2) field density (ASTM D2922, D1556, D2167, or D2937).

The fill material will be placed in 8-inch loose lifts, and field density tests will be conducted for each lift at randomly selected locations for every 500 bcy for fill areas at the Arsenic AOC. If ASTM D2922 is used, a minimum of one in ten tests will be checked using sand cone (ASTM D1556) or rubber balloon (ASTM D2167). Test results from ASTM D 1556 or ASTM D 2167 will govern if there is a discrepancy with the ASTM D2922 test results.

The backfilling will continue until the grade of the excavation is approximately six inches below the surrounding grade. Following this, six inches of Class II aggregate base will be placed on the backfilled areas and compacted to 90 percent of the maximum dry density.

3.12 FUGITIVE DUST CONTROL

Fugitive dust emissions will be controlled during the RA implementation to comply with the SCAQMD Rules 401 and 403. Some of the measures that may be taken to control the fugitive dust emissions include wetting down the excavation areas with water, tarping, and slowing down the rate of excavation.

3.13 REMOVAL-DERIVED WASTE

The removal-derived waste including disposable personal protective equipment and decontamination water will be managed as described in Section 2.1.7 of the Sampling and Analysis Plan (Appendix A).

3.14 CONSTRUCTION QUALITY ASSURANCE/CONSTRUCTION QUALITY CONTROL PLAN

The project organization for RA implementation includes representatives from the DON, BCI, the Accord Team, and the QC Manager. The responsibilities of key personnel within each of these organizations are discussed in Section 3.1, and the overall organization and relationships of these individuals are illustrated in Figure 3-1.

The Construction Quality Assurance/Construction Quality Control (CQC) Plan presents the QC procedures to be followed during the RA implementation at the Arsenic AOC. The purpose of this plan is to establish the framework within which QA/QC procedures for removal of the Arsenic AOC will be implemented to assure that the completed RA meets design criteria, plans, and all the performance requirements.

3.14.1 Meetings

Meetings will be held throughout the implementation of the RA.

3.14.1.1 PRECONSTRUCTION MEETING

A preconstruction meeting shall be held at the site prior to the start of construction. At a minimum, the NFECSW SDIEGO's RPM and ROICC; the Accord Team's representative, HSO, QC Engineer, Project Engineer, and Site Superintendent shall attend the meeting.

3.14.1.2 CQC/PROGRESS MEETINGS

Weekly CQC/progress meetings shall be held between the NFECSW SDIEGO RPM, ROICC, and the Accord Team's representative, HSO, QC Engineer, and Site Superintendent. These meetings will include a discussion of current progress, planned activities for the next week, issues requiring resolution, and any new business or revisions to the work. If any major field activity is scheduled, the RPM, ROICC or a designee, and the Accord Team will ensure the following during the CQC meeting:

- All applicable permits have been obtained and notifications have been completed,
- Adequately trained, qualified individuals will perform the work,
- Appropriate plans and procedures are in place,
- Adequate, calibrated equipment is available,
- Subcontractors meet project and subcontract requirements, and
- All other requirements for satisfactory performance of work have been met.

The Accord Team's representative shall keep minutes that document any problems, decisions, action items, or questions arising at each of these meetings, and minutes shall be transmitted and reviewed by all parties present prior to the next week's meeting. If any matter remains unresolved at the end of this meeting, the NFECSW SDIEGO RPM/ROICC shall be responsible for the resolution of the matter and the communication of the decision to the appropriate parties.

3.14.2 Quality Assurance/Quality Control

3.14.2.1 SUBMITTALS

Submittals will be prepared by the Accord Team with the assistance of appropriate subcontractors and suppliers and shall include the following:

- Site-Specific Health and Safety Plan,
- Traffic Control Plan,
- Field Change Requests (FCRs), Field Change Notices (FCNs), and Nonconformance Reports (NCRs),
- Progress reports,
- QC certificates,
- Waste shipping documents,
- Backfill testing,
- Closure Report,
- Confirmation sampling and analysis, and
- Record (as-built) drawings.

All submittals shall be transmitted to the NFECSW SDIEGO RPM and ROICC who will review each submittal for completeness (see Submittal Register in Appendix F).

3.14.2.2 CONSTRUCTION MONITORING AND TESTING

Inspections and Surveillance

To confirm construction quality and maintain compliance with contract documents, the project QC Engineer or designated representative shall conduct monitoring and surveillance during the RA at Arsenic AOC on a daily basis. For the implementation of effective quality control, the removal action construction at the Arsenic AOC is divided into following definable features of work (DFOWs):

- Utility Clearance,
- Site Preparation,
- Demolition/Excavation,
- Off-site Transportation of Excavated Soil, and
- Backfilling and Site Restoration.

Each DFOW is a separate and distinct task and has separate quality control requirements. In general, the QC Engineer will inspect and survey each DFOW in three phases—preparatory phase, initial phase, and follow-up phase. The preparatory phase will be performed prior to beginning work on

each DFOW; the initial phase will be accomplished at the beginning of a DFOW; and follow-up phase will be performed to assure continuing compliance with contract requirements. The quality control checklists for each of the three phases associated with each DFOW are presented in Appendix G.

Construction Observation

The QC Engineer or designated representative shall observe construction activities to verify that the project design and performance requirements presented in the RA Work Plan and RA contract are met. The Project QC Engineer shall report any nonconformance to the NFECSW SDIEGO RPM. The NFECSW SDIEGO RPM will issue stop work notices only for major nonconformance items (i.e., those that affect the integrity and intent of the RA or when worker safety is compromised).

Defects and Repairs

The QC Engineer shall assess the nature and extent of defects in construction for each DFOW. The QC Engineer, after determining the extent of the deficient area with additional testing, observations, record reviews, or other appropriate means, will address defects indicated by unsatisfactory test results. If adverse weather conditions are encountered during construction, the Project QC Engineer shall examine the material surfaces for possible damage in wet, desiccated, or windblown areas.

The QC Engineer shall notify the NFECSW SDIEGO RPM and the ROICC after the extent and nature of the defect has been identified. A work deficiency meeting may be held as needed between the Project QC Engineer, RPM, and other necessary parties to address the problem.

The Accord Team shall correct all deficiencies to meet the project design and performance requirements presented in the RA Work Plan and RA contract. If weather conditions affect work or project design and performance requirements cannot be met, the Project QC Engineer shall develop and present suggested solutions to the NFECSW SDIEGO RPM and ROICC for approval. The QC Engineer shall perform a retest in the area where a defect has been corrected. All retests must verify that the defect has been corrected prior to performing additional work in the deficiency area. Tests, retests, and corrections will be documented in the closure report (prepared by the Accord Team). The QC Engineer shall observe repairs and report any noncompliance in writing to the NFECSW SDIEGO RPM and ROICC.

Testing Requirements

Construction quality control testing will be required for backfilling and site restoration during RA implementation at Arsenic AOC. The field and laboratory tests will be conducted for assessing the quality of the compacted fill and aggregates in accordance with the methods and frequencies presented in Section 3.11 of the RA Work Plan.

3.14.2.3 QUALITY ASSURANCE AUDITS

The RPM and/or ROICC, or their designated representative will be responsible for conducting QA audits for checking the adequacy of construction QC implemented. When deficiencies are encountered, the site superintendent and the QC manager will be notified. The QC Manager will be responsible for monitoring the status of corrective actions (if any) and verifying completion. When all required corrective actions have been completed, the QC Manager shall complete a corrective action report and submit it to the RPM/ROICC.

3.14.3 Quality Control Documentation

The QC Engineer shall document that all requirements in the CQC plan have been addressed and satisfied. The following reports shall contain, at a minimum, identifying sheet numbers for cross-

referencing and document control, the date, project name, location, descriptive remarks, data sheets, inspection activities, and signatures of the designated authorities with concurrence of the QC Engineer.

3.14.3.1 DAILY REPORTS

The QC Engineer shall complete a Daily Construction Report outlining all activities for that day. The report shall at a minimum consist of field notes, observations, test data sheets, construction problems, health and safety meeting sign-in sheet, and solution data sheets. A summary of all supporting data sheets and final testing results shall be required upon completion of construction.

3.14.3.2 NONCONFORMANCE REPORTS

NCRs will be used to alert responsible personnel of problem areas and nonconforming items. Such occurrences will be recorded separately on individual nonconformance NCRs. The QC Engineer will inform the NFECSW SDIEGO RPM and the ROICC of materials or workmanship that do not meet a specified design. At the instruction of the NFECSW SDIEGO RPM or the ROICC, the QC Engineer will provide a written NCR with problems listed, referring to specific inspection data sheets where the problem is identified. Upon correction, the NCR shall be updated with actions taken and test data that prove the problem was corrected. The updated NCR shall be routed to the NFECSW SDIEGO RPM and the ROICC for concurrence.

3.14.3.3 FIELD CHANGE REQUESTS AND FIELD CHANGE NOTICES

Requests for changes to the project design and performance requirements shall be referred to the NFECSW SDIEGO RPM and the ROICC using FCR and FCN forms. These will be reviewed, evaluated, documented, and controlled by procedures agreed upon between the NFECSW SDIEGO RPM, the ROICC, and the Accord Team. The NFECSW SDIEGO RPM/ROICC will review all significant implementation changes with consultation from the EPA RPM and Cal-EPA RPMs prior to implementation.

Requests for modifications to the CQC plan shall be made by memorandum to the NFECSW SDIEGO RPM, and the ROICC.

If during the course of construction, questions arise regarding interpretation of the contractual requirements, the QC Engineer will contact the NFECSW SDIEGO RPM and the ROICC. The QC Engineer will document any clarification of the drawings in a memorandum or teleconference records, and route clarification documentation to the NFECSW SDIEGO RPM and ROICC for concurrence, then to project files for record.

3.14.3.4 TEST REPORTS

The QC Engineer will maintain all records of laboratory and field testing performed on soil. Test results will be summarized by the QC Engineer on an ongoing basis, and submitted with the weekly progress reports.

3.14.3.5 PROGRESS REPORTS

Progress reports will be prepared by the QC Engineer and submitted to the NFECSW SDIEGO RPM and the ROICC on a weekly basis. These reports provide an overview of construction progress to date, problems or deficiencies encountered during construction, actions taken to correct the situation, a summary of weather conditions, health and safety documentation, and a brief summary of anticipated work. Daily reports, NCRs, FCRs, FCNs, inspection checklists, and test reports will be summarized and included in progress reports, along with a copy of the minutes of the weekly progress meeting. The QC Engineer will be responsible for distributing progress reports to the NFECSW SDIEGO RPM and ROICC.

3.14.3.6 RECORD DRAWINGS

As construction proceeds, the Accord Team shall maintain a set of record drawings with all changes made to the drawings. At the completion of construction, record drawings shall be prepared to document as-built conditions. The drawings shall be approved by a Professional Engineer registered in the state of California. The final record drawings will be reviewed by the NFECSW SDIEGO RPM/ROICC. "Record Drawings" shall be clearly marked above the title block and the words "Final Revision" placed in the title block.

3.14.3.7 QUALITY CONTROL CERTIFICATIONS

The QC Engineer is required to provide signed QC certification statements on daily reports, attesting that, except for those items listed in the NCRs, the work is in compliance with project design and performance requirements specified in the RA Work Plan and RA contract. Upon completion of work under the contract, the QC Manager shall provide the DON with a certification attesting that the work has been completed, inspected, and tested, and is in compliance with the contract.

3.14.3.8 CLOSURE REPORT

At the completion of the project, the Accord Team will submit a closure report to the NFECSW SDIEGO RPM and ROICC. This report will provide comprehensive documentation that the removal action was conducted in accordance with the Action Memorandum and that the removal action objectives have been achieved. The report will include all of the daily reports, NCRs, test reports, progress reports, record drawings, confirmation sampling results, and QC certifications. The final documentation should emphasize that areas of responsibility and lines of authority were clearly defined, understood, and accepted by all parties involved in the project.

3.14.4 Document and Project Record Control

A record system shall be implemented that designates responsibility for document, manual, and record management and provides for organization, filing, control, storage, and transfer of project records, including electronic media associated with the RA.

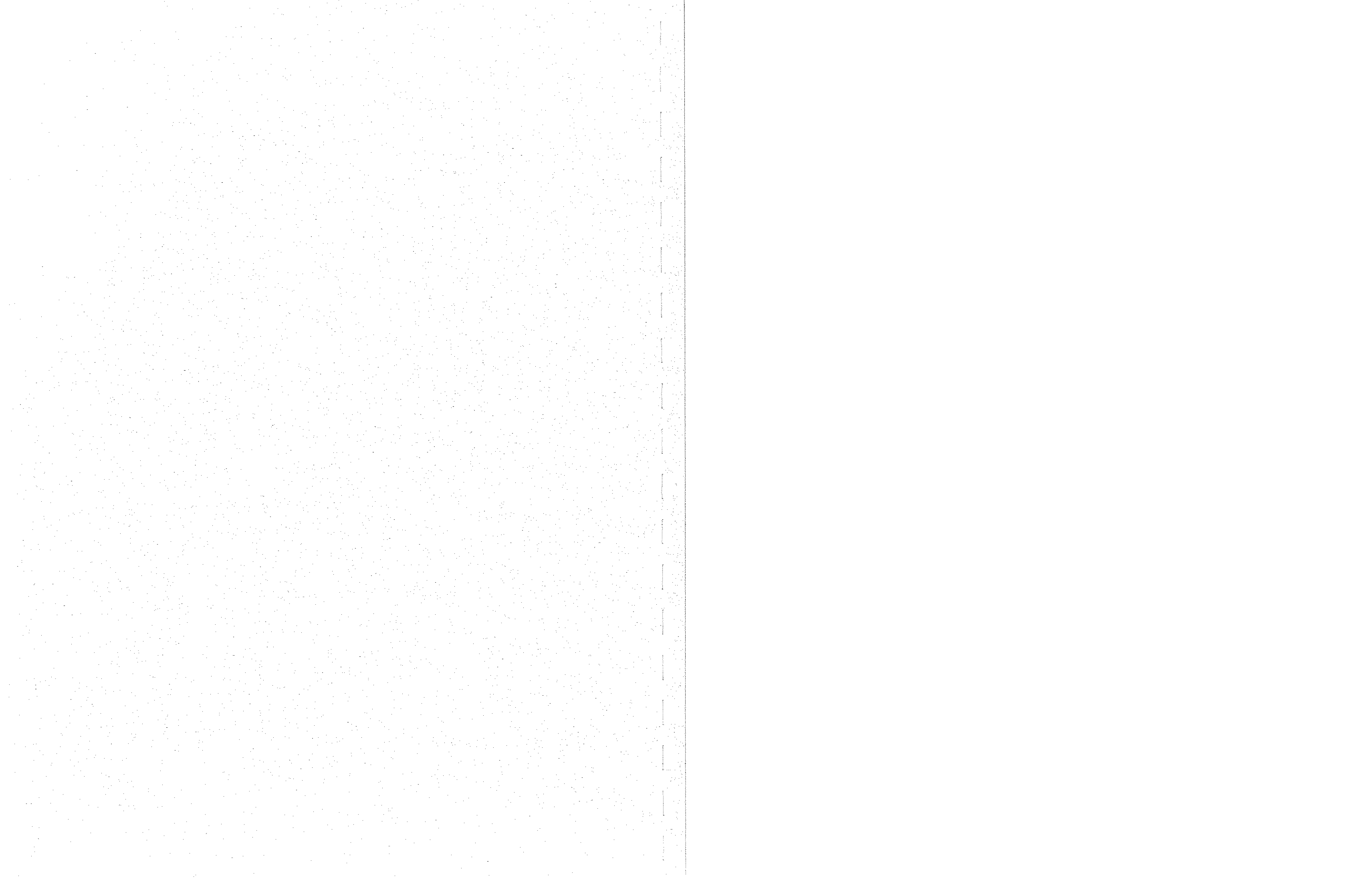
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Appendix A

Sampling and Analysis Plan

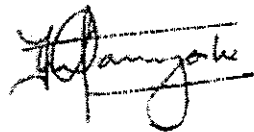
Appendix A
Sampling and Analysis Plan



Appendix A
Final
Sampling and Analysis Plan
(Field Sampling Plan and Quality Assurance Project Plan)
Work Plan, Non-Time-Critical Removal Action
Arsenic Area of Concern
Former Marine Corps Air Station Tustin, California

Contract No. N68711-04-C-1006

Reviews and Approvals:



Crispin Wanyoike, P.E.
Project Manager
Earth Tech, Inc.

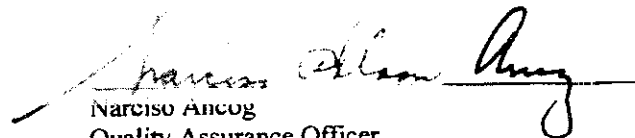
Date: 27 July 2004



7/27/2004

Christopher S. Barr, CQMgr
Quality Manager
Earth Tech, Inc.

Date: 27 July 2004



Narciso Ancog
Quality Assurance Officer
U.S. Naval Facilities Engineering Command,
Southwest Division

Date: 7/27/04

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ACRONYMS AND ABBREVIATIONS

Accord Team	Accord Engineering, Inc. and Earth Tech, Inc.
AOC	area of concern
BCT	BRAC Cleanup Team
BEC	BRAC Environmental Coordinator
BRAC	Base Realignment and Closure Act
BNI	Bechtel National, Inc.
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	contract laboratory program
CO	Contracting Officer
cy	cubic yards
DON	Department of the Navy
DOT	Department of Transportation
DQO	data quality objective
DTSC	Department of Toxic Substances Control
EDD	electronic data deliverable
EPA	Environmental Protection Agency
EWI	Environmental Work Instruction
HSO	Health and Safety Officer
ID	Identification
IRCDQM	Navy Installation Restoration Chemical Data Quality Manual
LCS	laboratory control sample
MCAS	Marine Corps Air Station
NFECSW SDIEGO	Southwest Division, Naval Facilities Engineering Command
NFESC	Naval Facilities Engineering Service Center
PCB	polychlorinated biphenyl
PPE	personnel protective equipment
PRG	preliminary remediation goal
IPH	total petroleum hydrocarbon
QA	quality assurance
QAO	Quality Assurance Officer
QAPP	quality assurance project plan
QC	quality control
RA	removal action
RCRA	Resource Conservation and Recovery Act
RDW	removal-derived waste
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
SOP	standard operating procedure
SOW	statement of work
SVOC	soluble volatile organic compound
SWDIV	Southwest Division, Naval Facilities Engineering Command
VOC	volatile organic compound
U.S.	United States

COMPARISON OF EPA QA/R-5 ELEMENTS WITH SAP

Comparison of the Quality Assurance Project Plan Requirements in EPA QA/R-5 with Elements of this SAP

EPA QA/R-5 Elements		Arsenic AOC Removal Action SAP	
		Section #	Section Title
A1	Title and Approval Sheet	--	Title and Approval Sheet
A2	Table of Contents	--	Table of Contents
A3	Distribution List	--	Distribution List
A4	Project/Task Organization	3.1	Project Organization and Key Personnel Responsibilities
A5	Problem Definition/Background	1.1.1	Problem Statement for Confirmatory Soil Sampling
		1.2.1	Problem Statement for Backfill Source Evaluation
A6	Project/Task Description	2.1.2	Soil Excavation
		2.1.5	Backfilling and Compaction
A7	Quality Objectives and Criteria	1.1	Data Quality Objectives for Confirmatory Soil Sampling
		1.2	Data Quality Objectives for Backfill Source Evaluation
A8	Special Training/Certification	1.3	Special Training
A9	Documents and Records	3.3	Documentation and Deliverables
B1	Sampling Process Design (Experimental Design)	1.1.7	Sampling Design (Confirmation Sampling)
		1.2.7	Sampling Design (Backfill Source Evaluation Sampling)
B2	Sampling Methods	2.1.3	Cleanup Confirmation Sampling
		2.1.4	Characterization of Backfill Material
B3	Sample Handling and Custody	2.1.9	Sample Containers and Preservation
		2.1.10	Sample Packaging and Shipment
		2.1.11	Sample Documentation
B4	Analytical Methods	3.4.2	Laboratory Analytical Methods and Requirements
B5	Quality Control	3.4.3	Quality Control Requirements
B6	Instrument/Equipment Testing, Inspection, and Maintenance	3.4.4	Calibration and Preventive Maintenance
B7	Instrument/Equipment Calibration and Frequency	3.4.4	Calibration and Preventive Maintenance
B8	Inspection/Acceptance of Supplies and Consumables	3.4.5	Acceptance Requirements for Supplies and Consumables
B9	Non-direct Measurements	3.4.6	Non-direct Measurements
B10	Data Management	3.4.7	Data Management
C1	Assessments and Response Actions	3.5	Project Quality Assurance Oversight
C2	Reports to Management	3.5.5	Reports to Management
D1	Data Review, Verification, and Validation	3.6.1	Desktop Data Review
		3.6.2	Data Validation
D2	Verification and Validation Methods	3.6.2	Data Validation
		3.6.3	Data Usability
D3	Reconciliation with User Requirements	3.6.4	Reconciliation with User Requirements

1. INTRODUCTION

This sampling and analysis plan, which consists of a field sampling plan and a quality assurance project plan (QAPP), was prepared for the removal action (RA) at the Arsenic Area of Concern (AOC), at the former Marine Corps Air Station (MCAS) Tustin, California.

This work plan has been prepared by Accord Engineering, Inc. and Earth Tech, Inc. (Accord Team) on behalf of the United States (U.S.) Department of the Navy (DON), Southwest Division, Naval Facilities Engineering Command (NFECSW SDIEGO formerly abbreviated as SWDIV), in accordance with contract no. N68711-04-C-1006.

1.1 DATA QUALITY OBJECTIVES FOR CONFIRMATORY SOIL SAMPLING

Following excavation of the soil in accordance with the removal action specifications, soil sampling will be conducted at the Arsenic AOC to confirm that the contaminated fill soil exceeding the target cleanup goal for arsenic (17.5 mg/kg at Building 190 and its vicinity, and 35 mg/kg at the hotspot locations at Building 251) has been removed. The sampling design, developed using the Data Quality Objectives (DQO) process (Environmental Protection Agency [EPA] 2000), is summarized below.

1.1.1 Problem Statement

Arsenic in excess of the specified cleanup criteria has been identified in soils at the Arsenic AOC. A removal action has been developed to excavate and dispose of the fill soil, and replace it with clean soil so that the residual risk is within the background risk range (calculated based on Station-wide arsenic background concentration of 17.5 mg/kg). For planning purposes, the target cleanup goals for arsenic (17.5 mg/kg at Building 190 and its vicinity, and 35 mg/kg at the hotspot locations at Building 251) will serve as an initial comparison criteria to evaluate cleanup at the site. The distribution of arsenic in the soil at the Arsenic AOC is variable and non-homogenous. The objective of the sampling and analysis is to verify that cleanup criteria have been achieved and the residual risk is within the background risk range.

1.1.2 Identification of the Decision

The principal study question for confirmatory soil sampling is as follows:

1. Has the fill soil exceeding the target cleanup goal of arsenic (17.5 mg/kg) been removed at Building 190 and its vicinity?
2. Has the fill soil exceeding the target cleanup goal for arsenic (35 mg/kg) been removed at the hotspots at Building 251?

If the confirmatory sampling results suggest that the target cleanup goals for arsenic-contaminated fill soil has not been attained, further excavation and additional soil sampling will be conducted.

1.1.3 Identification of Inputs to the Decision

Visual observations will be used to help distinguish between arsenic-contaminated fill and native soil; these observations will be used to help optimize the excavation boundaries prior to collecting confirmation samples.

To resolve the decision statement, analytical results of soil samples will be compared to the target cleanup goals for arsenic, which were developed based on the established background concentration

of arsenic at former MCAS Tustin (Bechtel National, Inc. [BNI] 1996) and presented in the Action Memorandum (DON 2004). The data will be evaluated to assess whether the target cleanup goals for arsenic have been attained and the residual risk is within the background risk range.

1.1.4 Boundaries of the Study

Confirmatory soil sampling will be conducted for the soil at the Arsenic AOC after the excavation of contaminated soil has been completed in accordance with the design specifications. The extent of the study area is the fill soil underlying the Arsenic AOC as presented in Figure 2-1 of the Work Plan.

1.1.5 Development of a Decision Rule

The objective of the removal action at the Arsenic AOC is to excavate the arsenic-contaminated fill soil that exceeds the background arsenic concentration. Based on the sampling design presented in Section 1.1.7 the decision rules for evaluating the cleanup at Building 190 and its vicinity, and at the hotspot locations at Building 251 at the Arsenic AOC, arranged sequentially, are presented below and are summarized in Figure 2-3 of the Work Plan.

- **Decision Rule 1:** If the concentrations of arsenic-contaminated fill soil (poorly graded sand with gravel) are below their respective target cleanup goals at Buildings 190 and 251 in all discrete samples, ***then*** no further excavation or sampling will be needed.
- **Decision Rule 2:** If the concentrations of arsenic exceed their respective target cleanup goals at Buildings 190 and 251 in one or more discrete samples in areas where the native/fill interface is not discernible, then
 1. further excavation will be conducted, and
 2. a discrete soil sample will be collected from each re-excavated area and analyzed for arsenic, and cleanup in the localized area will be reevaluated based on Decision Rules 1 and 2.
- **Decision Rule 3:** If the concentrations of arsenic in native soil exceed the target cleanup goals for the fill soils at Buildings 190 and 251, ***then*** the residual risk will be calculated based on the results of all discrete samples for documentation purposes, and no further excavation or sampling will be conducted.

1.1.6 Tolerable Limits on Decision Error

In order to establish a reasonable scope for this removal action, the following were included in the assumptions to develop the sampling design at Building 190 and its vicinity at the Arsenic AOC:

1. Null Hypothesis: The true mean of arsenic is greater than or equal to the target cleanup goal for arsenic.
2. The distribution of arsenic is unknown and cannot be determined within the scope of the resources available. Therefore, all assumptions are nonparametric.
3. False rejection rate (Alpha) of 5 percent.
4. False acceptance rate (Beta) of 20 percent.

- 5. Standard deviation of 10.83 (calculated from the actual results obtained from the investigation of arsenic concentration in native soil at Buildings 190 and 251 during the Preliminary Assessment conducted by Earth Tech in 2001).
- 6. Width of gray region (Delta) of 10.83 (the width of the gray region was set at 1 times standard deviation).

The above parameters were entered into the Visual Sample Plan Software (Pacific Northwest National Laboratory, Version 2.2), which resulted in the estimate of the required number of samples to complete the investigation at Building 190 and its vicinity.

The decision on the number of samples at the hotspot locations at Building 251 will be based on judgment. Therefore, there are no probabilities associated with the decision and consequently no limits on decision errors were defined.

The baseline condition (i.e., the null hypothesis) considered that the more severe decision error occurs if the arsenic concentration exceeds its target cleanup goal. The types of decision errors along with their consequences are described in Table A-1.

Table A-1: Decision Errors and their Consequences

Baseline Condition	Type of Error	True State of Nature	Potential Consequences of Decision Error
Arsenic present at concentrations above the target cleanup goal	<i>False Rejection or False Positive:</i> Arsenic is present at concentrations below the target cleanup goal	Arsenic is present at concentrations above the target cleanup goal.	Unacceptable risk to human health due to exposure to the soil containing arsenic above the target cleanup goal.
	<i>False Acceptance or False Negative:</i> Arsenic is present at concentrations above the target cleanup goal.	Arsenic is present at concentrations below the target cleanup goal.	Unnecessary expenditure of resources on second round of excavation and confirmatory sampling.

1.1.7 Sampling Design

The sampling strategy selected for confirmation sampling at the Arsenic AOC consists of discrete sampling. The discrete samples will be collected using systematic and grid sampling with random start location. Systematic and grid sampling will ensure complete coverage of the site and provides a practical and easy method for designating sample locations.

In accordance with systematic and grid sampling design, the site was divided into a rectangular grid of approximately 170 feet by 120 feet cells (see Figure 2-4 of the Work Plan). At Building 190 and its vicinity, nine discrete samples will be collected from the bottom or sidewalls of the excavation. In addition, up to ten additional sidewall samples may be collected in consultation with regulatory agencies, to confirm that the arsenic-contaminated fill soils have been removed, if the contact between the native and the fill soil is not discernible. At Building 251, two discrete samples will be collected from the bottom of the excavation, and a discrete sample will be collected from each sidewall at the two-hotspot locations. The discrete samples will be analyzed and the analytical results of each sample will be compared with target cleanup goals for arsenic.

1.2 DATA QUALITY OBJECTIVES FOR BACKFILL SOURCE EVALUATION

This section presents data quality objectives for chemical characterization of the backfill material in order to document that uncontaminated material is being used. The geotechnical criteria for the backfill material are presented in Section 3.11 of the Work Plan.

1.2.1 Problem Statement

If the results of the confirmation sampling indicate that the cleanup goals have been achieved at the Arsenic AOC and the regulatory agencies concur, backfilling operations will begin. In order to minimize the potential of introducing contaminated fill material onto the site, soil sampling will be conducted to document that the fill source selected for backfill material is appropriate.

1.2.2 Identification of the Decision

The principal study question for backfill source evaluation sampling is as follows:

- Is the fill source selected for backfill material appropriate?

Fill material with contaminant concentrations in excess of the decision criteria will not be used.

1.2.3 Inputs to the Decision

To resolve the principal study question, soil samples will be collected from the selected borrow area and may be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), pesticides, herbicides, polychlorinated biphenyls (PCBs), and metals depending on the borrow source. Department of Toxic Substances Control (DTSC) guidance on backfill evaluation (DTSC 2001) will be used to determine the number of samples to be collected from the borrow source and the target analyte groups. The appropriateness of the fill source will be evaluated by the following:

- comparison of soil sample analytical results for organic analytes (VOCs, SVOCs, pesticides, herbicides, and PCBs) with EPA IX Residential (EPA 2002) preliminary remediation goals (PRGs).
- comparison of soil sample analytical results for metals with the established MCAS Tustin background concentrations

1.2.4 Boundaries of the Study

The spatial boundary of the study area will be defined by the physical boundaries of the selected borrow area. Soil sampling in the borrow area will be conducted prior to the removal of fill soil from the borrow area based on DTSC guidance (DTSC 2001).

1.2.5 Development of a Decision Rule

The decision rules for backfill source evaluation based on the sampling design presented in Section 1.2.7 are presented below:

- **Decision Rule 1:** *If* soil concentrations of organic analytes (VOCs, SVOCs, pesticides, herbicides, and PCBs) are below their respective PRGs, and the concentrations of all the metals are below their respective station-wide background values, *then* the selected borrow area will be used as a source of backfill material
- **Decision Rule 2:** *If* soil concentrations of one or more organic analytes (VOCs, SVOCs, pesticides, herbicides, and PCBs) exceed their respective PRGs, or the concentrations of one

or more metals exceed their respective station-wide background values, in one or more soil samples, *then*

- an alternative borrow source will be selected,
- soil sampling at the alternate borrow source will be conducted, and
- analytical results will be evaluated based on Decision Rules 1 and 2.

1.2.6 Tolerable Limits on Decision Error

The decision on the number of soil samples at the selected fill source area will be based on recommendations provided in the DTSC fact sheet entitled, "Information Advisory, Clean Imported Fill Material" (DTSC 2001). Since the recommended sampling design in this guidance is not probability-based sampling design, probabilities of making decision errors cannot be defined for this study.

1.2.7 Sampling Design

The sampling strategy for backfill source evaluation is based on the recommendations of DTSC (DTSC 2001). Two different methods are suggested in the DTSC fact sheet to determine the number of samples required for backfill material assessment based on the approximate stockpile volume or area of the soil to be used as fill material. Assuming fill material is sampled from the borrow area with stockpile volume of greater than 5,000 cubic yards (cy) and approximately 10,600 cy is required for backfilling the Arsenic AOC; 18 soil samples will be collected to assess the fill source area. The samples will be analyzed in accordance with DTSC recommendations.

Since the number of collected samples for fill source assessment (12 samples for the first 5,000 cy, plus one sample for each additional 1,000 cy) is estimated based on assumptions regarding the stockpile volume at the borrow area and the volume of backfill material required, this number may change during the implementation of removal action at the Arsenic AOC, if the above-mentioned assumptions are not valid.

1.3 SPECIAL TRAINING

No specific training has been identified for this work. The Project Manager will ensure staff selected to perform the work have requisite training and experience.

2. FIELD SAMPLING PLAN

Sampling objectives at the Arsenic AOC are:

- Confirmatory soil sampling, following excavation, to verify that the arsenic-contaminated fill soil exceeding the target cleanup goals has been removed, and
- Characterization of the borrow source soil used to backfill the excavated areas at the Arsenic AOC to document that the backfill soil material is suitable for the planned use.

2.1 FIELD METHODS AND PROCEDURES

Fieldwork will be performed in accordance with applicable Comprehensive Long-Term Environmental Navy (CLEAN) standard operating procedures (SOPs) (BNI 1999). Field personnel will have copies of all referenced SOPs during the fieldwork. Any necessary significant modifications or deviations (e.g., changes in equipment, materials, or deletion of a procedural step) will be first discussed with the RA Project Manager, and the U.S. Navy Remedial Project Manager (RPM). Approval for significant modifications will be obtained from the Navy Quality Assurance Officer (QAO). Approved CLEAN SOPs were submitted to the Base Realignment and Closure Act (BRAC) Cleanup Team (BCT) by NFECSW SDIEGO. Copies of the SOPs have been provided in Appendix B.

2.1.1 Geophysical Survey

Project personnel will evaluate records prior to preliminary field marking of the sampling locations. The evaluation will include available site plans, utility layouts, as-built drawings, and results of previous subsurface investigations.

In conjunction with this information, a non-intrusive geophysical survey will be conducted using magnetic and electromagnetic methods to locate subsurface utilities.

2.1.2 Soil Excavation

The proposed lateral and vertical limits of soil excavation at the Arsenic AOC are shown in Figure 2-1 of the Work Plan. Conventional excavation equipment such as front-end loaders, backhoes, and excavators will be used to remove the soil.

The soil excavation (approximately 4,900 bank cubic yards) will occur at Buildings 190 and 251 (demolished as a part of the redevelopment activities) areas. Following the demolition of the building foundations, the excavated soil will be loaded into trucks for transportation to an approved disposal facility.

Before the excavated areas are backfilled, samples will be collected from the sidewalls and bottom of the excavated areas in accordance with the sampling plan shown in Figure 2-4 of the Work Plan. These samples will be analyzed within 24 hours. If the results indicate that the soil exceeding the target cleanup goals has been removed from the site in accordance with the decision rules described in Section 1.1.5, the excavated areas will be backfilled and the site will be restored as described in Section 3.11 of the Work Plan. If the sampling results show that cleanup has not been achieved in accordance with the decision rules described in Section 1.1.5, further excavation and subsequent soil sampling will be conducted.

2.1.3 Cleanup Confirmation Sampling

As shown in Figure 2-4 of the Work Plan, nine discrete samples will be collected from the sidewalls and bottom of excavation at Building 190 and its vicinity. In addition, up to ten additional sidewall samples may be collected in consultation with regulatory agencies, to confirm that the arsenic contaminated fill soils have been removed, if the contact between the native and the fill soil is not discernible. At Building 251, two bottom discrete samples will be collected from the hotspot locations and a discrete sample will be collected from each sidewall at the two-hotspot locations. Soil Samples will be collected using unused disposable trowels, in accordance with CLEAN SOP 4, *Soil Sampling* (BNI 1999). Table A-2 presents sampling and analysis summary for the confirmatory sampling.

Table A-2: Planned Confirmation Soil Sampling and Analysis Summary

		Discrete Field Samples
Arsenic	EPA Method 6010B	19

2.1.4 Characterization of Backfill Material

The soil used to backfill the excavated areas of the Arsenic AOC will be obtained from an off-Station source. To document that this backfill soil material does not contain contaminants above the EPA Region IX PRGs (for organic analytes) or soil background concentrations (for metals), eighteen soil samples will be collected based on the recommendations of DTSC (DTSC 2001) from an off-site source and may be analyzed for the following, based on the characterization of the borrow source (see Table A-7):

- VOCs (EPA SW-846 Method 8260B)
- SVOCs (EPA SW-846 Method 8270C)
- TPH (EPA SW-846 Method 8015B)
- Pesticides (EPA SW-846 Method 8081A)
- Herbicides (EPA SW-846 Method 8151)
- PCBs (EPA SW-846 Method 8082)
- Metals (EPA SW-846 Method 6010B)

All the samples will be collected using unused disposable trowels, in accordance with CLEAN SOP 4, *Soil Sampling* (BNI 1999).

2.1.5 Backfilling and Compaction

After it has been confirmed that the arsenic-contaminated soil exceeding the target cleanup goals has been removed, and concurrence of regulatory agencies on the achievement of the cleanup levels at the site has been obtained, backfill operations will begin.

The fill material will be characterized before backfilling as described in Section 2.1.4, and backfilling will be performed under the supervision of a civil engineer to restore the site to original grading and drainage conditions.

2.1.6 Surveying

A California-registered land surveyor will conduct land survey of all confirmatory soil sample locations for horizontal location to the nearest 0.1 foot, vertical location to the nearest 0.01 foot, and referenced to mean sea level. A stake will be placed at the sampling location. A plan view of the horizontal limits will be prepared for use on project closure report drawings.

2.1.7 Removal-Derived Waste

During the RA at the Arsenic AOC, the following wastes (removal derived wastes [RDW]) are expected to be generated, in addition to excavated soil and construction debris (asphalt and concrete):

- Decontamination water, and
- Disposable personal protective equipment (PPE), sampling equipment, and miscellaneous debris encountered during the RA.

RDW will be properly classified, labeled, managed, and disposed of in accordance with CLEAN SOP 22, *IDW Management* (BNI 1999). If the RDW generated during sampling is regulated by the RCRA, then RCRA storage, transport, and disposal requirements may apply. In general, proper implementation of RDW procedures requires task managers, field managers, and their designees to perform the following tasks:

- Minimize RDW as it is generated.
- Segregate RDW by matrix and source location.
- Follow proper procedures for RDW drum handling and labeling.
- Prepare an RDW drum inventory.
- Update and report changes to the RDW drum inventory.

Decontamination Water. Non-disposable sampling equipment, the backhoe bucket, and PPE will be cleaned and decontaminated between each sampling or activity location. Decontamination water will be collected in Department of Transportation (DOT)-approved 55-gallon drums. As a precautionary measure, drums containing liquid RDW will be left with a headspace of 5 percent by volume to allow for expansion of the liquid. The drums will be labeled in accordance with CLEAN SOP 22, *Waste Management* (BNI 1999). Drums containing RDW will be inventoried daily, stored on pallets at a designated staging area, and covered with tarps. Upon completion of fieldwork, a final inventory of the drums will be conducted to ensure that they are labeled correctly and that all drums are present.

Disposable PPE and Sampling Equipment. If, based on the best professional judgment of the Field Manager, the PPE and disposable sampling equipment can be rendered nonhazardous after decontamination procedures, then this equipment will be collected in double plastic bags and disposed of offsite as municipal waste. Equipment that is potentially contaminated will be stored in drums, labeled, inventoried, and disposed of as hazardous waste. All waste materials generated in the support zone are considered non-RDW trash and will be properly disposed of as municipal waste.

2.1.8 Equipment Decontamination

All nonconsumable equipment that comes into contact with potentially contaminated soil will be decontaminated in accordance with CLEAN SOP 11, *Decontamination of Equipment* (BNI 1999). Equipment will be decontaminated by steam cleaning or by a non-phosphate detergent scrub, followed by fresh water and distilled or deionized water rinses. Decontamination will take place on pallets or on plastic sheeting. Clean equipment will be stored on plastic sheeting in an uncontaminated area. Equipment stored for an extended period will also be covered with plastic sheeting.

All consumable equipment (e.g., gloves), liquid, and solid wastes (e.g., decontamination water, and soil cuttings) will be treated as potentially hazardous and handled accordingly.

The field team will perform personal decontamination prior to leaving the work site at the conclusion of each workday, following procedures described in the project *Health and Safety Plan* prepared for this work.

2.1.9 Sample Containers and Preservation

Table A-3 lists the chemical parameters to be tested and the types of containers and preservation methods to be used. This table includes information for sample collection during confirmatory soil sampling and backfill characterization. These may be modified to accommodate the preferences of the laboratory, but will meet the essential requirements of the method.

2.1.10 Sample Packaging and Shipment

Sample lids and caps will be covered with custody seals. All samples will be recorded on chain-of-custody forms in accordance with CLEAN SOP 10, *Sample Custody, Transfer, and Shipment* (BNI 1999). Samples will be shipped or delivered within 24 hours to allow the laboratory to meet holding times for analysis.

Two copies of the chain-of-custody forms will be placed in an adhesive plastic pouch and taped to the inside of each sample cooler. The coolers will then be sealed with waterproof tape and labeled "Fragile," "This End Up" (or with directional arrows pointing up), and other appropriate notices. Coolers will also have custody seals to prevent tampering.

Upon receipt, the laboratory will sign and retain copies of the air bill. A list of analyses to be performed and a space to record sample condition upon receipt are located on the chain-of-custody record. The laboratory representative will sign the chain-of-custody form and record the temperature of the samples or cooler on the chain-of-custody form and on the sample condition upon receipt form. In case of breakage or discrepancies between the chain-of-custody form, sample labels, or requested analyses, the sample custodian will notify the Laboratory Project Manager. A nonconformance report will be completed and the Project Chemist will be notified within 24 hours. At the time of notification, a corrective action will be chosen. The sample custodian will enter the information into the laboratory system and a log-in confirmation sheet will be sent to the project chemist within 48 hours. The laboratory will send the Project Chemist a written declaration of the samples in each sample delivery group.

Hazardous Materials Shipment. Hazardous materials, as defined by the DOT, are not expected in the course of this project. Shipment of soil samples is not expected to exceed the minimal quantities for hazardous materials handling. The field team leader has been trained to recognize hazardous or dangerous goods and will notify the Task Manager of such issues prior to shipping.

Table A-3: Requirements for Sample Preservation, Maximum Holding Time, and Containers

Test	Analytical Methods	Preservation	Maximum Holding Time	Number x Sample Container Type
Pesticides/PCBs	EPA Method SW 8081/8082	Cool to 4°C	14 days ^b /40 days ^c	16-oz glass jar or stainless steel liner with Teflon-lined lid/end caps
Chlorinated Herbicides	EPA Method SW 3550B/ SW 8151A	Cool to 4°C	14 days ^b /40 days ^c	
Total Extractable Petroleum Hydrocarbons	EPA Method SW 3550B/ SW 8015B	Cool to 4°C	14 days ^b /40 days ^c	
Total Volatile Petroleum Hydrocarbons	EPA Method SW 5035A/ SW 8015B	Cool to 4°C/frozen	48 hours ^a (14 days, when frozen)	Three Encore type soil sampling devices
VOCs	EPA Method SW 5035A/ SW 8260B	Cool to 4°C/frozen	48 hours ^a (14 days, when frozen)	Three Encore type soil sampling devices
SVOCs	EPA Method SW 3550B/ SW 8270C	Cool to 4°C	14 days ^b /40 days ^c	One 16-oz glass jar or stainless steel liner with Teflon-lined lid/end caps
Metals	EPA Method SW 3050B/ SW 6010/7000	None	6 months ^a (28 days for mercury)	One 16 oz-glass jar or stainless steel liner with Teflon-lined lid and end caps

Notes:

- ^a From sample collection to analysis
- ^b From sample collection to extraction
- ^c From sample extraction to analysis
- °C = degrees Celsius

2.1.11 Sample Documentation

Sample containers will be labeled as follows:

1. Labels will be written in indelible ink with the following information:
 - Project name or identifier,
 - EPA sample identification (ID) number,
 - Date and time of collection,
 - Initials of the person collecting the sample,
 - Method number or name of analysis to be performed, and
 - Preservative (if applicable).
2. A label with adhesive backing will be affixed to each sample container.
3. The label will be covered with clear tape to further secure it to the container and to keep the ink from smearing.

EPA Sample ID Number. To facilitate data tracking and storage, all samples will be labeled with an eight-character sample ID number, referred to as an EPA ID, in accordance with recordkeeping, sample labeling, and chain of custody procedures. The ID number for the Arsenic AOC is determined as follows:

L1006-zzz

Where,

- L** The Long Beach Office
- 1006** Contract Number for Removal Action at the Arsenic AOC, MCAS Tustin
- zzz** Chronological number, starting with 001

For example, the EPA number “L1006-030” would represent the 30th sample collected for the MCAS Tustin, Arsenic AOC RA project, a project managed by Accord Team. Quality Control (QC) samples will be included in the chronological sequence. If a sample is lost during shipping, a replacement sample will be assigned a new EPA number. If different containers for the same sample are shipped to the laboratory on different days, a new EPA number must be assigned. All sample identification numbers will be recorded in field logs, records, and a database to ensure traceability of the sample to the designated location or site.

Accord Team Sample ID Number. Samples will also be assigned an Accord Team sample ID, which will be recorded in field logs and databases. A descriptive sample ID number will specify the location, sequence, matrix, and depth, as follows:

RA-bb-ccd-e-ff

Where,

- RA** Removal Action at the Arsenic AOC, MCAS Tustin
- bb** Sample type and matrix (see Table A-4)
- cc** Grid number (numeric, e.g., 1, 2, 3)
- d** Chronological alphabetical order from a particular sampling grid (e.g., A, B, C)
- e** Sample or QC identifier (see Table A-5)
- ff** Depth of sample in feet bgs. For field blanks and equipment rinsates, the depth field will contain the date of collection.

Table A-4: Character Identifiers

Identifier	Sample Type	Matrix
SS	Soil Sample	Soil
QS	Field QC	Soil
QW	Field QC	Water

Table A-5: QC Identifiers

Identifier	QC Sample Type	Description
S	Normal Sample	All non-field QC samples
E	Equipment Rinsate	Water
F	Field Blank	Water

2.1.12 QC Samples

Field QC samples will be submitted in accordance with the referenced SOPs. The results of the analysis will be evaluated in accordance with the QAPP.

Field Duplicates. Due to the variability inherent in soil samples, the limited scope of the sampling effort, and the sufficient number of samples to be collected to characterize the excavation, field duplicates are not warranted.

Equipment Rinsates. All field sampling equipment will be unused, disposable equipment. No equipment rinsates or field blanks are planned.

3. QUALITY ASSURANCE PROJECT PLAN

The QAPP for the RA at the Arsenic AOC at former MCAS Tustin has been prepared in accordance with the requirements and specifications of the following:

- U.S. Navy Engineering Command, Southwest Division, *Environmental Work Instructions* (EWI) (DON 2001)
 - EWI #1, *Chemical Data Validation* (November 2001)
 - EWI #2, *Review, Approval, Revision, and Amendment of Sampling and Analysis Plans* (November 2001)
 - EWI #3, *Laboratory Quality Assurance Program* (November 2001)
- Navy Installation Restoration Chemical Data Quality Manual (IRCDQM) (Naval Facilities Engineering Service Center [NFESC] 1999)

The elements in this QAPP are in addition to the Construction Quality Assurance/Construction Quality Control Plan given in Section 3.14 of the RA Work Plan.

3.1 PROJECT ORGANIZATION AND KEY PERSONNEL RESPONSIBILITIES

The project organization for RA implementation at the Arsenic AOC includes representatives from the Department of the Navy, the BCT, the Accord Team, and the Quality Assurance (QA) Manager. The responsibilities of key personnel within each of these organizations are discussed below. The overall organization and relationships of these individuals are illustrated on Figure A-1.

3.1.1 NFEC SW SDIEGO Representatives

The positions and responsibilities of NFEC SW SDIEGO representatives are as follows:

- **Contracting Officer** The Contracting Officer (CO) is responsible for the negotiation and execution of the construction contract. The CO is responsible for providing technical direction to the construction contractor.
- **Remedial Project Manager** The RPM is responsible for all activities that take place at the various sites within MCAS Tustin. Specific tasks include reviewing recommendations made by the Accord Team, including reviewing proposed changes to the engineering design and overseeing the overall implementation of the removal action.
- **Resident Officer in Charge of Construction** The Resident Officer in Charge of Construction (ROICC) supports the RPM in coordination of all the work that takes place at MCAS Tustin. Specific tasks include reviewing vendor submittals and personnel qualifications, conducting constructability reviews, and overseeing construction.
- **Quality Assurance Officer** The QAO is responsible for government oversight of the QA program and provides quality-related direction for the project. The QAO has the authority to suspend project or site activities if NFEC SW SDIEGO-approved quality requirements are not adequately followed.

3.1.2 BRAC Cleanup Team

The positions and responsibilities of BRAC Cleanup Team (BCT) personnel are as follows:

- **BRAC Environmental Coordinator (BEC)** The BEC is the NFECSW SDIEGO representative who chairs the BCT and is responsible for coordinating environmental restoration and compliance programs and updating the BRAC Cleanup Plan at MCAS Tustin.
- **U.S. EPA RPM, California EPA RPMs [i.e., DTSC RPM, and Regional Water Quality Control Board, Santa Ana Region RPM]** These agency RPMs are responsible for overseeing and monitoring the progress of RA and conformance of these activities with the requirements of the federal facilities agreement

3.1.3 Accord Team

The position and responsibilities of key Accord Team members are as follows:

- **Program Manager** The Program Manager is responsible for all aspects of the removal action program.
- **Project Manager** The Project Manager has overall responsibility for all construction work performed during implementation of the RA. Responsibilities include project planning, scheduling, staffing, execution of tasks and subcontracts, and managing deliverables.
- **QC Manager** The QC Manager is responsible for developing the QC process and to ensure compliance with the project-specific procedures and requirements provided in the RA contract, RA Work Plan, and statements of work developed by the Accord Team. The QC Manager will be independent of the cost, scheduling, and other performance constraints that are the responsibility of the Project Manager.
- **Health and Safety Manager** The Health and Safety Manager is responsible for developing and implementing of the program health and safety plan and project-specific modifications and amendments.
- **Contracts/Procurement Manager** The Contracts Manager is responsible for soliciting, selecting, and managing subcontracts for RA construction services and materials required for the project.
- **Health and Safety Officer (HSO).** The project HSO is responsible for establishing and maintaining communications with all site personnel concerning the project-specific health and safety plan, verifying adherence to site safety requirements, organizing and conducting safety meetings (tailgate meetings), and recording and documenting safety incidents on site.
- **Project QC Engineer** The project QC Engineer is responsible for ensuring that subcontractors and vendors comply with project requirements and contractual obligations and that all field activities are performed as required by the project design. The QC Engineer is a qualified and trained person who reports to the QC Manager on quality matters.
- **Project Engineer** The Project Engineer assists the Superintendent and the Project Manager by reviewing engineering design documents and interfacing with engineering design personnel and field operations to communicate job requirements.
- **Site Superintendent** The Site Superintendent is responsible for day-to-day supervision of staff and coordination of tasks for project completion. This includes review of engineering design documents, planning and oversight of field activities, and QC.
- **Project Chemist** The Project Chemist is responsible for ensuring that the field sampling and laboratory analyses are performed in accordance with laboratory and field sampling procedures identified in the field sampling plan and quality assurance project plan of the RA Work Plan.

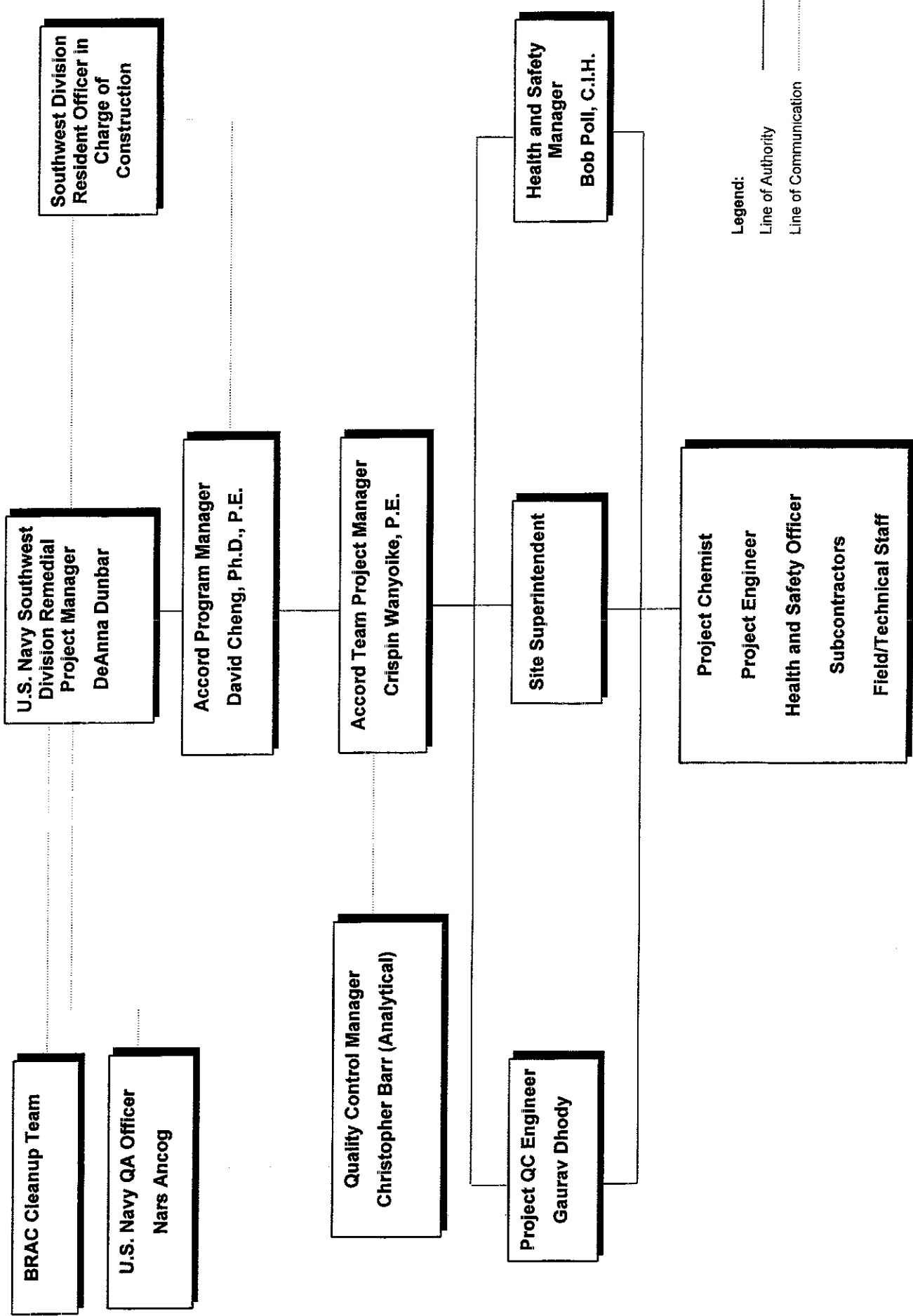


Figure A-1: Organization Chart

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- **Field, Technical, and Health and Safety Staff** Technical staff will perform QC activities, including subcontractor observation, sampling, testing, and documentation during RA implementation. Health and safety personnel will develop and implement the site-specific health and safety plan.

3.2 SCHEDULE

The schedule shown on Figure A-2 is for planning purposes and will be revised as needed.

3.3 DOCUMENTATION AND DELIVERABLES

Project records and documentation will be maintained in accordance with the procedures established for this program.

Field Documentation Records will be kept in accordance with CLEAN SOP 17, *Logbook Protocols* (BNI 1999). In accordance with CLEAN SOP 17, *Logbook Protocols* (BNI 1999), a bound field notebook with consecutively numbered, water-repellent pages will be maintained. The logbook will be clearly identified with the name of the activity, the person responsible for maintaining the logbook, and the beginning and ending dates of the entries. Data forms, with predetermined formats for logging field data, will be incorporated into the logbook. This logbook will serve as the primary record of fieldwork. Logbooks will allow a reviewer to reconstruct applicable events from entries made in chronological order and in sufficient detail. The logbook will be maintained in a clean area and used only when outer gloves have been removed. Entries on the data forms and in the logbook will meet the same requirements. Entries will be made in indelible ink. Information recorded in the logbook will include the following:

- The logbook will reference data maintained in other logs.
- Corrections to entry records will be made by drawing a single line through the incorrect entry, initialing, and dating the change. An explanation will be included if more than a simple mistake is made.
- Entries will be signed or initialed by the individual making the entry at the end of each day.
- Page numbers will be entered on each logbook page.
- The preparer will photocopy completed pages weekly. The Field Manager will conduct a technical review of the logbook.

Laboratory Documentation The laboratory will provide Level IV data packages for soil sampling results, as required to perform validation, in accordance with EPA guidance for data review (EPA 1994a and EPA 1994b) and the NFECSW SDIEGO EWI #1 (DON 2001). The packages will include a case summary, report forms, QC sample analysis results, acceptance criteria, calculations, chromatograms, and applicable bench logs and preparation notes. The laboratory will also provide data deliverables in a specified electronic format compatible with the project database, developed in compliance with the Naval Environmental Data Transfer System. All laboratory deliverables will be submitted within 14 calendar days of receipt of samples.

3.4 MEASUREMENT AND DATA ACQUISITION

All samples will be collected in accordance with Navy CLEAN II Program Procedures (BNI 1999), except as modified to meet project-specific requirements and as presented in this QAPP.

3.4.1 Field Sampling QC Measurements

Field QC samples will be submitted in accordance with the referenced SOPs. The results of the analysis will be evaluated in accordance with the QAPP.

Field Duplicates. Due to the variability inherent in soil samples, the limited scope of the sampling effort, and the sufficient number of samples to be collected to characterize the excavation, field duplicates are not warranted.

Equipment Rinsates. All field sampling equipment will be unused, disposable equipment. No equipment rinsates or field blanks are planned.

3.4.2 Laboratory Analytical Methods and Requirements

Laboratory services will be subcontracted with NFESC evaluated laboratories qualified to perform work for this project. The subcontracts specify the work to be performed, which shall be done in accordance with the referenced method and the IRCDQM (NFESC 1999). For confirmatory and backfill material characterization soil samples, the target analyte lists are presented in Table A-6 and Table A-7 respectively.

3.4.2.1 PESTICIDES

Pesticides will be measured in soil samples using EPA Method 8081A. Sample preparation will be in accordance with methods cited in 8081A. Pesticide compounds in the waste characterization will also be analyzed in accordance with EPA Method 8081A after extraction of the waste.

3.4.2.2 CHLORINATED HERBICIDES

Samples will be analyzed for target compounds by gas chromatography with an electron capture detector in general accordance with EPA Method 8151A.

3.4.2.3 PCBs

PCBs will be measured in soil samples using EPA Method 8082. Sample preparation will be in accordance with methods cited in 8082. PCBs in the waste characterization samples will also be analyzed in accordance with EPA Method 8082 after extraction of the waste extract with the referenced method.

3.4.2.4 METALS

Soil samples will be analyzed for metals by trace inductively coupled plasma, EPA Method 6010, except where an alternative method will be needed to achieve the target reporting limits in the sample matrix. Samples will be analyzed for contract laboratory program (CLP) target list metals by SW6010 or 7000 series methods. Soil will be prepared in accordance with 3050B, and water in accordance with 3010A.

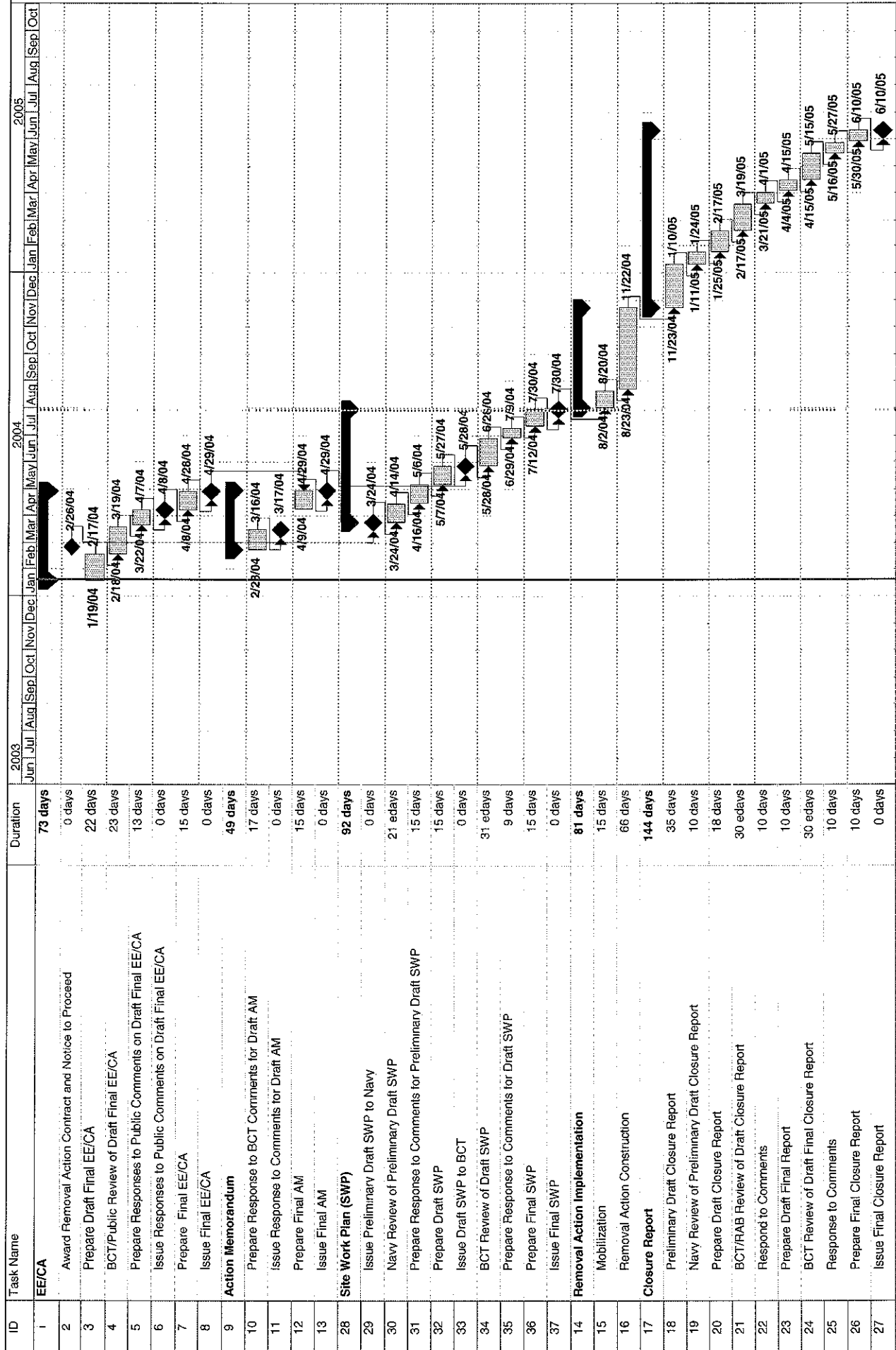
Extracts of waste samples will be analyzed for metals listed in Table A-7 in accordance with Methods 6010 and 7471 (for mercury), prepared in accordance with the method requirements.

3.4.2.5 VOCs

VOCs will be analyzed in accordance with EPA Method 8260B, using sample collection and preparation in accordance with EPA 5035A for soil and 5030B for water. The analytes will be compounds on the CLP target list.

Figure A-2

Figure A-2 - Project Schedule
Non-Time Critical Removal Action
Arsenic AOC, Former MCAS Tustin



3.6.2 Data Validation

The data validation strategies presented in the NFECSW SDIEGO EWI #1 specify investigations at National Priorities List sites will be subject to a minimum of 20 percent Level IV validation with the remainder of the data subject to Level III validation.

Due to the nature of the validation process, Level III and IV data validation will be performed on complete sample delivery groups (i.e., all samples in a package will be validated at Level III or IV as assigned). This may result in a higher percentage of Level IV validated data than planned, but the approach will save in management and tracking resources.

3.6.2.1 LEVEL III VALIDATION

A minimum of Level III validation, as described in NFECSW SDIEGO EWI #1, will be performed on all samples collected during the investigation. Systematic concerns identified in Level III may be cause for additional Level IV review. Such review will be conducted until a return to compliance is verified.

3.6.2.2 LEVEL IV VALIDATION

Level IV validation will be performed on at least 20 percent of the samples, typically the first data packages submitted by the laboratory. The Level IV validation is intended to identify if any significant, systematic errors are present in the laboratory procedures or processes. If the Level IV validation identifies systematic errors, the laboratory will be required to initiate corrective action and ensure that such errors are corrected.

3.6.3 Data Usability

The final report will summarize the data validation findings, indicating the processes and findings of the review process. Data reported in the project report will be flagged with appropriate qualifiers to indicate the usability.

Data may be assigned the following qualifiers:

- J = estimated concentration
- N = presumptive evidence of the identification of an analyte
- R = rejected data (unusable)
- U = not detected (e.g., not present because of blank contamination)

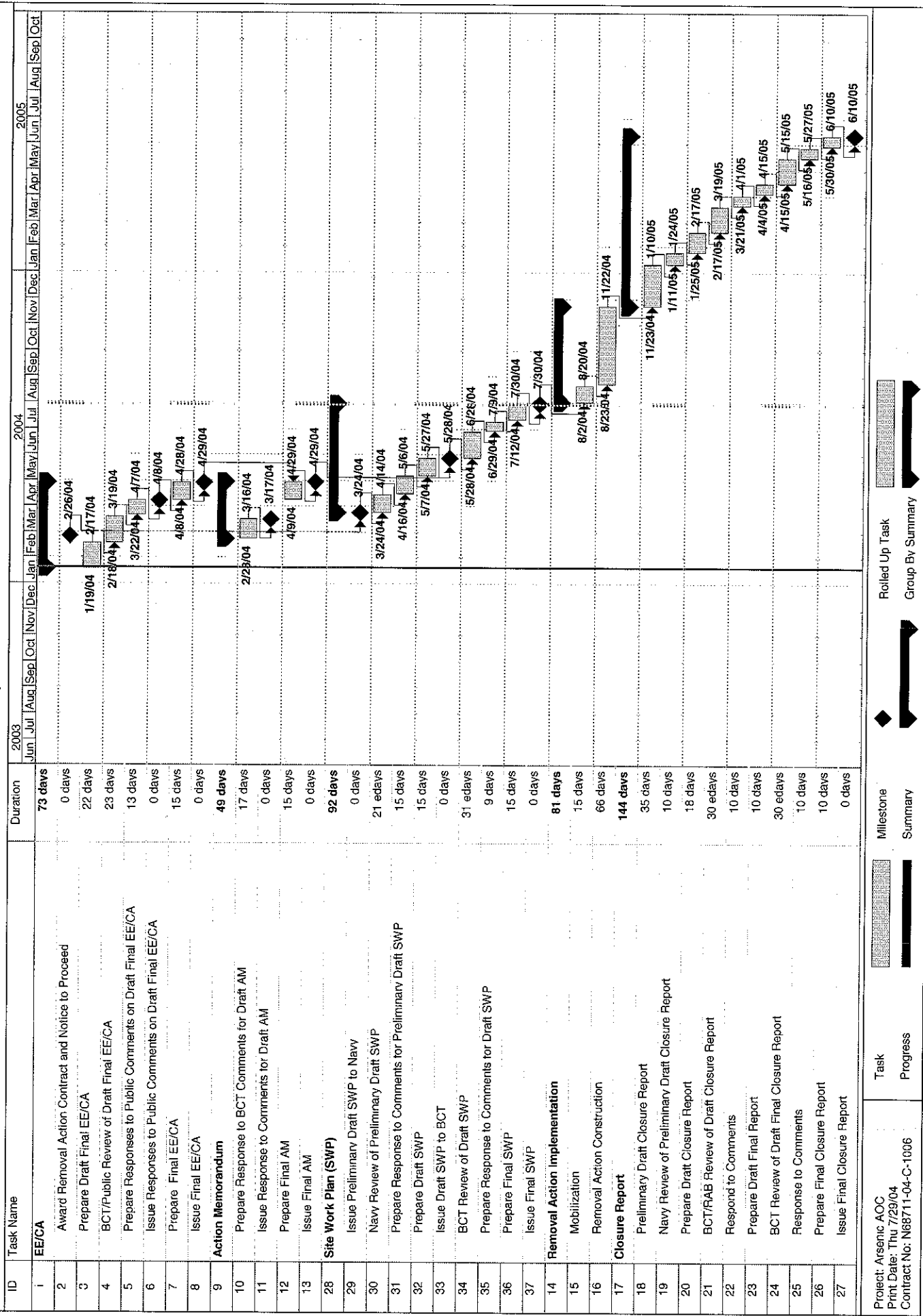
Combinations of qualifiers such as UJ and NJ are possible. Where the validation qualifiers affect the project decision recommendations, the report will evaluate the issue and implement the necessary corrective action.

3.6.4 Reconciliation with User Requirements

The validated data will be evaluated to assess if it satisfies data quality objectives (e.g., tolerable limits on decision errors) and is adequate to resolve the decision rules for the planned sampling.

Figure A-2

Figure A-2 - Project Schedule
Non-Time Critical Removal Action
Arsenic AOC, Former MCAS Tustin



3.4.2.6 VOLATILE PETROLEUM HYDROCARBONS

Volatile hydrocarbons will be evaluated for the approximate carbon range C6 through C12, using purge and trap followed by gas chromatography. Soil samples will be collected and prepared in accordance with EPA Method 5035.

3.4.2.7 EXTRACTABLE PETROLEUM HYDROCARBONS

Extractable hydrocarbons will be evaluated for the approximate carbon range C10 through C36, using extraction and gas chromatography. Samples will be collected and analyzed in accordance with EPA Method 8015B for soil and water.

3.4.2.8 SVOCs

Samples will be analyzed for SVOCs in accordance with EPA Method 8270C. The analytes will be compounds on the CLP target list.

Table A-6: Project Quality Control Criteria for Confirmatory Soil Sampling

Analyte	Project Decision Threshold ^a	Reporting Limit Required	Precision (RPD)	Accuracy (%R) ^b	
				MS/MSD	LCS
Metals (Preparation: SW 3050B; Analysis: 6010A) (mg/kg)					
Arsenic	17.5	0.3	20	75–125	80–120

Notes:
Mg/kg = milligrams per kilogram
LCS = laboratory control sample
MS = matrix spike
MSD = matrix spike duplicate
^a For arsenic, the calculated background value has been used.
^b Laboratory-specific performance criteria

RPD = relative percentage of difference
% R = percent recovery
SW = Test Method Solid Waste (EPA 1997b)

Table A-7: Project Quality Control Criteria for Backfill Material Characterization Soil Samples

Analyte	Project Decision Threshold	Reporting Limit Required	Precision (RPD)	Accuracy (%R) ^a	
				MS/MSD	LCS
Total Volatile Petroleum Hydrocarbons (Extraction: SW5035A; Analysis: SW8015B) (mg/kg)					
Volatile Petroleum Hydrocarbons	10	10	28	71–127	72–124
Total Extractable Petroleum Hydrocarbons (Extraction: SW3550B; Analysis: SW8015B) (mg/kg)					
Extractable Petroleum Hydrocarbons	10	10	50	50–149	51–134
VOCs (Extraction: SW5035A; Analysis: SW8260B) (µg/kg)					
1,1,1,2-Tetrachlorethane	3200	5	30	65–135	65–135
1,1,1-Trichloroethane	1,200,000	5	30	65–135	65–135
1,1,2,2-Tetrachloroethane	410	5	30	64–135	64–135
1,1,2-Trichloroethane	730	5	30	65–135	65–135
1,1,2-Trichlorotrifluoroethane (F113)	5,600,000	5	50	50–150	50–150
1,1-Dichloroethane	2,800	5	30	62–135	62–135
1,1-Dichloroethene	120,000	5	29	69–127	71–125
1,2- Dichlorotetrafluoroethane (F114)	—	5	50	50–150	50–150
1,2-Dichloroethane	280	5	30	58–137	58–137
Cis-1,2-Dichloroethene	43,000	5	30	65–135	65–135
trans-1,2-Dichloroethene	69,000	5	30	65–135	65–135
1,2-Dichloropropane	340	5	30	60–135	60–135
2-Butanone (MEK)	7,300,000	100	50	50–150	50–150
2-Hexanone	—	50	50	50–150	50–150
4-Methyl-2-pentanone (MIBK)	790,000	50	50	50–150	50–150
Acetone	1,600,000	100	50	35–165	35–165
Benzene	600	5	22	75–119	76–118
Bromodichloromethane	820	5	30	65–135	65–135
Bromoform	62,000	5	30	65–135	65–135
Bromomethane	3,900	5	30	62–135	62–135
Carbon disulfide	360,000	5	30	65–135	65–135
Carbon tetrachloride	250	5	30	52–135	52–135
Chlorobenzene	150,000	5	21	75–125	76–116
Chloroethane	3,000	5	30	55–135	55–135
Chloroform	940	5	30	64–135	64–135
Chloromethane	1,200	5	30	65–135	65–135
Cis-1,3-Dichloropropene	780	5	30	64–135	64–135
Dibromochloromethane	1,100	5	30	63–135	63–135
Dichlorodifluoromethane (F12)	94,000	5	50	50–150	50–150
di-Isopropyl ether (DIPE)	—	5	50	50–150	50–150
Ethyl tertiary butyl ether (ETBE)	—	5	50	50–150	50–150
Ethylbenzene	8900	5	30	65–135	65–135

Table A-7: Project Quality Control Criteria for Backfill Material Characterization Soil Samples

Analyte	Project Decision Threshold	Reporting Limit Required	Precision (RPD)	Accuracy (%R) ^a	
				MS/MSD	LCS
Methylene chloride	9,100	5	30	65–135	65–135
Methyl-tert-butyl ether (MTBE)	17,000	5	50	50–150	50–150
Styrene	1,700,000	5	30	65–135	65–135
Tertiary amyl methyl ether (TAME)	—	5	50	50–150	50–150
Tertiary butyl alcohol (TBA)	—	20	50	50–150	50–150
Tetrachloroethene	1,500	5	29	66–125	69–121
Toluene	520,000	5	21	72–126	72–126
trans-1,3-Dichloropropene	780	5	30	56–135	56–135
Trichlorofluoromethane (F11)	390,000	5	50	50–150	50–150
Trichloroethene	53	5	30	61–135	61–135
Vinyl chloride	79	5	30	36–144	36–144
Xylenes (total)	270,000	15	30	65–135	65–135
SVOCs (Extraction: SW3550B; Analysis: SW8270C) (µg/kg)					
1,2,4-Trichlorobenzene	650,000	500	61	10–132	40–116
1,2-Dichlorobenzene	370,000	500	30	32–135	32–135
1,3-Dichlorobenzene	16,000	500	30	26–135	26–135
1,4-Dichlorobenzene	3,400	500	57	15–128	38–116
2,2'-oxybis(1-Chloropropane)	2,900	500	30	36–135	36–135
2,4,5-Trichlorophenol	6,100,000	500	30	25–175	25–175
2,4,6-Trichlorophenol	6,100	500	30	29–138	29–138
2,4-Dichlorophenol	180,000	500	30	36–135	36–135
2,4-Dimethylphenol	1,200,000	500	30	35–149	35–149
2,4-Dinitrophenol	120,000	2,500	30	25–161	25–161
2,4-Dinitrotoluene	120,000	500	61	12–134	38–118
2,6-Dinitrotoluene	61,000	500	30	41–135	41–135
2-Chloronaphthalene	4,900,000	500	30	50–135	50–135
2-Chlorophenol	63,000	500	54	12–120	35–113
2-Methylnaphthalene	—	500	30	31–135	31–135
2-Methylphenol	3,100,000	500	30	25–135	25–135
2-Nitroaniline	1,700	2,500	30	40–135	40–135
2-Nitrophenol	—	500	30	34–135	34–135
3,3'-Dichlorobenzidine	1,100	500	30	25–175	25–175
3-Nitroaniline	—	2,500	30	41–135	41–135
4,6-Dinitro-2-methylphenol	—	2,500	30	25–144	25–144
4-Bromophenyl-phenylether	—	500	30	43–137	43–137
4-Chloro-3-methylphenol	—	500	58	10–126	37–113
4-Chloroaniline	240,000	1,000	30	35–146	35–146

Table A-7: Project Quality Control Criteria for Backfill Material Characterization Soil Samples

Analyte	Project Decision Threshold	Reporting Limit Required	Precision (RPD)	Accuracy (%R) ^a	
				MS/MSD	LCS
4-Chlorophenyl-phenyl ether	—	500	30	41–142	41–142
4-Methylphenol	310,000	500	30	25–135	25–135
4-Nitroaniline	—	2,500	30	30–153	30–153
4-Nitrophenol	—	2,500	60	12–132	15–128
Acenaphthene	3,700,000	500	59	16–134	41–118
Acenaphthylene	—	500	30	37–135	37–135
Anthracene	22,000,000	500	30	35–175	35–175
Benzo(a)anthracene	620	500	30	41–143	41–143
Benzo(a)pyrene	62	500	30	31–135	31–135
Benzo(b)fluoranthene	620	500	30	27–135	27–135
Benzo(g,h,i)perylene	—	500	30	25–159	25–159
Benzo(k)fluoranthene	620	500	30	31–135	31–135
bis(2-Chloroethoxy)methane	—	500	30	39–135	39–135
bis(2-Ethylhexyl)phthalate	35,000	500	30	34–135	34–135
bis-(2-Chloroethyl)ether	210	500	30	25–139	25–139
Butylbenzylphthalate	12,000,000	500	30	25–135	25–135
Carbazole	24,000	500	30	25–159	25–159
Chrysene	3,800	500	30	45–143	45–143
Di-n-butylphthalate	6,100,000	500	30	40–135	40–135
Di-n-octylphthalate	2,400,000	500	30	42–135	42–135
Dibenz(a,h)anthracene	62	500	30	27–135	27–135
Dibenzofuran	290,000	500	30	25–175	25–175
Diethylphthalate	49,000,000	500	30	25–136	25–136
Dimethylphthalate	100,000,000	500	30	28–137	28–137
Fluoranthene	2,300,000	500	30	37–135	37–135
Fluorene	2,700,000	500	30	38–149	38–149
Hexachlorobenzene	300	500	30	36–143	36–143
Hexachlorobutadiene	6,200	500	30	25–135	25–135
Hexachlorocyclopentadiene	370,000	2,500	30	31–135	31–135
Hexachloroethane	35,000	500	30	25–163	25–163
Indeno(1,2,3-cd)-pyrene	620	500	30	25–170	25–170
Isophorone	510,000	500	30	25–175	25–175
N-Nitroso-di-n-propylamine	690	500	30	40–135	40–135
N-Nitroso-diphenylamine	99,000	2,500	30	36–143	36–143
Naphthalene	56,000	500	30	27–135	27–135
Nitrobenzene	20,000	500	62	10–134	32–122
Pentachlorophenol	3,000	1,700	62	10–134	15–128

Table A-7: Project Quality Control Criteria for Backfill Material Characterization Soil Samples

Analyte	Project Decision Threshold	Reporting Limit Required	Precision (RPD)	Accuracy (%R) ^a	
				MS/MSD	LCS
Phenanthrene	—	500	30	44–135	44–135
Phenol	37,000,000	500	53	10–116	30–111
Pyrene	2,300,000	500	56	22–134	38–130
Metals (Preparation: SW 3050B; Analysis: Mercury SW 7471, all other metals SW 6010) (mg/kg)					
Aluminum	36,300	5	20	75–125	80–120
Antimony	1.4	3	20	75–125	80–120
Arsenic	17.5	0.3	20	75–125	80–120
Barium	305	1	20	75–125	80–120
Beryllium	1.1	0.2	20	75–125	80–120
Cadmium	1.8	0.2	20	75–125	80–120
Calcium	125,000	10	20	75–125	80–120
Chromium	39.2	0.5	20	75–125	80–120
Cobalt	15.1	0.5	20	75–125	80–120
Copper	41.5	0.5	20	75–125	80–120
Iron	44,900	3	20	75–125	80–120
Lead	23.4	0.3	20	75–125	80–120
Magnesium	19,800	0.5	20	75–125	80–120
Manganese	1,100	10	20	75–125	80–120
Mercury	---	0.2	20	75–125	80–120
Nickel	27.8	0.2	20	75–125	80–120
Potassium	6,910	20	20	75–125	80–120
Selenium	3.7	0.3	20	75–125	80–120
Silver	—	0.5	20	75–125	80–120
Sodium	6,320	100	20	75–125	80–120
Thallium	1.6	0.4	20	75–125	80–120
Vanadium	80.6	0.5	20	75–125	80–120
Zinc	141	1	20	75–125	80–120
PCBs (SW 8082A) (µg/kg)					
Aroclor 1016	3900	33	50	45–140	50–145
Aroclor 1221	220	66	NA	NA	NA
Aroclor 1232	220	33	NA	NA	NA
Aroclor 1242	220	33	NA	NA	NA
Aroclor 1248	220	33	NA	NA	NA
Aroclor 1254	220	33	NA	NA	NA
Aroclor 1260	220	33	50	45–140	50–145
Pesticides (SW 8081A) (µg/kg)					
Aldrin	29	1.7	50	45–135	50–140

Table A-7: Project Quality Control Criteria for Backfill Material Characterization Soil Samples

Analyte	Project Decision Threshold	Reporting Limit Required	Precision (RPD)	Accuracy (%R) ^a	
				MS/MSD	LCS
Alpha-BHC	90	1.7	50	45–135	50–140
Beta-BHC	320	1.7	50	45–135	50–140
Delta-BHC	—	1.7	50	45–135	50–140
Gamma-BHC (Lindane)	440	1.7	50	45–135	50–140
Alpha-Chlordane	1600	1	50	45–135	50–140
Gamma-Chlordane	1600	1	50	45–135	50–140
4,4'-DDD	2400	3	50	45–135	50–140
4,4'-DDE	1700	3	50	45–135	50–140
4,4'-DDT	1700	3	50	45–135	50–140
Dieldrin	30	3	50	45–135	50–140
Endosulfan I	370,000	3	50	45–135	50–140
Endosulfan II	370,000	3	50	45–135	50–140
Endosulfan sulfate	—	5	50	45–135	50–140
Endrin	18,000	3	50	45–135	50–140
Endrin aldehyde	18,000	3	50	45–135	50–140
Endrin ketone	18,000	3	50	45–135	50–140
Heptachlor	110	1.7	50	45–135	50–140
Heptachlor epoxide	53	1.7	50	45–135	50–140
Methoxychlor	310,000	10	50	45–135	50–140
Toxaphene	440	100	—	—	—
Herbicides (SW 8151A) (µg/kg)					
2,4-D	690,000	10	50	40–140	50–150
2,4-DB	490,000	10	50	40–140	50–150
2,4,5-TP (Silvex)	490,000	10	50	40–140	50–150
2,4,5-T	610,000	10	50	40–140	50–150
Dalapon	1,800,000	20	50	40–140	50–150
Dicamba	1,800,000	10	50	40–140	50–150
Dichloroprop	—	10	50	40–140	50–150
Dinoseb	61,000	20	50	30–150	30–150
MCPA	31,000	2000	50	40–150	40–150
MCPP	61,000	2000	50	40–150	40–150

Notes:
^a Laboratory-specific performance criteria.
— none established
(mdl) Laboratory will report to the method detection limit.
mg/kg milligrams per kilogram

EDDs will be received on diskettes or through electronic mail in the format specified in the analytical laboratory technical specifications. EDDs will be loaded into a database management system and checked for completeness and errors. Part of this check involves verifying that all requested analyses for each sample are performed and reported. This may be accomplished by comparing the delivered results to those recorded electronically. If errors are encountered or data are not complete, the laboratory will be notified and data will be resubmitted. If only minor errors or omissions are encountered, data management personnel will manually correct the data, and the laboratory will be notified so that it can rectify the problems for future projects. Once in the database, the records will be made accessible to project personnel.

The electronic data versus hard copy data will be manually verified for the entire project. Final data tables will be compared to the database to verify the output.

Computer files will be backed up daily to avoid loss of information. Hard copy data will be stored in secure areas, while electronic data will be stored in password-protected files, with read-only access to users who do not have authorization to edit the data. The data will be stored for ten years after the close of the contract.

Upon request of the NFECSW SDIEGO RPM, data will be submitted in an electronic format compliant with current specifications in NFECSW SDIEGO EW1 #6, *Environmental Data Management and Required Electronic Delivery Standards*.

3.5 PROJECT QA OVERSIGHT

Samples will be submitted to an NFESC-evaluated and approved laboratory for analysis by methods cited in Table A-6 and Table A-7. The laboratory will also be certified by the California State Environmental Laboratory Accreditation Program. Laboratory data quality strategies and criteria were developed in accordance with the project DQOs and the following references:

- *Installation Restoration Chemical Data Quality Manual* (NFESC 1999)
- *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods* (SW846) (EPA 2003)
- *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analysis* (EPA 1994a)
- *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis* (EPA 1994b)

System and performance audits are a fundamental element of the QA process and are the tool used to demonstrate compliance with data quality requirements.

Overall responsibility for implementation and monitoring of the Accord Team QA program resides with Project Quality Manager. The Project Quality Manager and the Task Manager will be responsible for reviewing the technical contents of all submittals required under this project. The QA activities applicable to this task are described in the SOPs (BNI 1999). The Accord Team peer review program will be followed during this project.

3.5.1 Field Audits

The Quality Assurance Manager is anticipated to visit the site weekly during fieldwork to assess field practices for compliance with procedures and requirements. Documentation of the review shall be included in the project files.

3.5.2 Laboratory System Audits

Laboratories solicited for this project are required to have successfully completed evaluation by the NFESC. Further evaluation of laboratory performance will be through data package reviews and oversight by the Project Chemist.

3.5.3 Laboratory Performance Review

Continual laboratory performance reviews will be conducted for the project. This will consist of the following tasks:

- Internal laboratory oversight by laboratory QC Manager,
- Frequent progress reports and discussions between the Project Chemist and the laboratory Project Manager,
- Project Chemist oversight of deliverables and reports,
- Desktop evaluation of reports and data packages, and
- Data validation, as discussed in Section 3.6.

3.5.4 Corrective Actions

Corrective action requests will be issued and tracked by the Project Chemist when deficiencies or instances of noncompliance are noted, whether in field audits or laboratory evaluations. These findings will be resolved in a timely manner, typically within 30 days, by the Project Manager and documented in the project file. Findings that affect the collection or interpretation of project data will be noted in the laboratory case narrative.

3.5.5 Reports to Management

Documentation of audits, copies of audit checklists, and copies of corrective action reports will be included in project files to be reviewed during management evaluation of project progress. Significant corrective actions, which are identified as having a direct effect on data quality or project completion, will be addressed by the Task Manager in writing to the Program Manager.

3.6 DATA VALIDATION AND USABILITY

All data developed in the course of the project will be evaluated for usability and compliance with measurement quality objectives. Field data will be tabulated and presented in the context of the data gathering activity. Laboratory data will be validated as specified below in accordance with the project DQOs and NECSW SDIEGO's environmental work instructions.

3.6.1 Desktop Data Review

Upon receipt, all field data will be reviewed by the Field Manager and Project Manager for internal consistency and completeness. Laboratory data will be reviewed by the Project Chemist and the Project Geologist for applicability to the assessment of the site.

3.6.2 Data Validation

The data validation strategies presented in the NFECSW SDIEGO EWI #1 specify investigations at National Priorities List sites will be subject to a minimum of 20 percent Level IV validation with the remainder of the data subject to Level III validation

Due to the nature of the validation process, Level III and IV data validation will be performed on complete sample delivery groups (i.e., all samples in a package will be validated at Level III or IV as assigned). This may result in a higher percentage of Level IV validated data than planned, but the approach will save in management and tracking resources.

3.6.2.1 LEVEL III VALIDATION

A minimum of Level III validation, as described in NFECSW SDIEGO EWI #1, will be performed on all samples collected during the investigation. Systematic concerns identified in Level III may be cause for additional Level IV review. Such review will be conducted until a return to compliance is verified.

3.6.2.2 LEVEL IV VALIDATION

Level IV validation will be performed on at least 20 percent of the samples, typically the first data packages submitted by the laboratory. The Level IV validation is intended to identify if any significant, systematic errors are present in the laboratory procedures or processes. If the Level IV validation identifies systematic errors, the laboratory will be required to initiate corrective action and ensure that such errors are corrected.

3.6.3 Data Usability

The final report will summarize the data validation findings, indicating the processes and findings of the review process. Data reported in the project report will be flagged with appropriate qualifiers to indicate the usability.

Data may be assigned the following qualifiers:

- J = estimated concentration
- N = presumptive evidence of the identification of an analyte
- R = rejected data (unusable)
- U = not detected (e.g., not present because of blank contamination)

Combinations of qualifiers such as UJ and NJ are possible. Where the validation qualifiers affect the project decision recommendations, the report will evaluate the issue and implement the necessary corrective action.

3.6.4 Reconciliation with User Requirements

The validated data will be evaluated to assess if it satisfies data quality objectives (e.g., tolerable limits on decision errors) and is adequate to resolve the decision rules for the planned sampling.

4. REFERENCES

Bechtel National, Inc (BNI) 1999. *CLEAN II Program Procedures Manual*. NFECSW SDIEGO: San Diego, California.

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———. 2003. *SW-846 On-Line, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. URL: <<http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>>. Office of Solid Waste.

Naval Facilities Engineering Service Center (NFESC). 1999. *Navy Installation Restoration Chemical Data Quality Manual (IRCDQM)*. NFESC Special Report SP-2056-ENV. Washington, D.C.: Naval Facilities Engineering Command. September.

Pacific Northwest National Laboratory. *Visual Sample Plan Software, version 2.2*. Richland, Washington.

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Appendix B

Standard Operating Procedures

Title: SOIL SAMPLING
Document Number: SOP 4
Revision Number: 2
Reason for Revision: To Incorporate Reference to U.S. EPA Method 5035
For Volatile Organic Compounds

Job No. 22214 (CLEAN II)
or
Job No. 23818 (CLEAN 3)

AUTHOR: Bong J. Kwon for SD.
Author
REVIEWED: Bong J. Kwon 6/20/00
Functional Manager Date
REVIEWED: Jon M. Gibbs 6-20-00
Quality Manager Date
APPROVED: Justin Lapier 6/20/00
Program Manager Date

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Rev: 2
Date: 06/07/00
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drill bit out of the borehole, attach the empty decontaminated soil sampler to the drill rod assembly and lower it into the borehole. The sampler shall not be dropped into the soil to be sampled but shall be suspended immediately above the desired sampling interval.

6. Mark the drill rods in successive 6-inch increments so that the advance of the soil sampler can be easily observed by the Bechtel environmental engineer/geologist. Advance the split-barrel sampler the required distance (generally 18 inches) with blows from the 140-pound hammer.
7. Count the number of blows applied for each 6-inch increment of sampler advance into subsurface soils and record this information on the borehole log in accordance with CLEAN SOP 3. Sampler refusal is generally indicated if more than 50 blows are required to advance the sampler 6 inches.
8. If an orientated geotechnical sample is required, mark each of the sample sleeves, if used, with a "T" and a "B," using a wax crayon or a pen with indelible ink, to indicate stratigraphic "top" and "bottom," respectively. Log the exposed soil at the ends of each sample sleeve other than the lowest in accordance with SOP 3.

Submit each of the sample sleeves for analysis or archival as stipulated in the CTO-specific FSP. In general, the lowermost sleeve shall be submitted to an analytical laboratory for testing if sample characteristics indicate its suitability, or archived in an on-site temporary storage area. The middle sleeve may be submitted to a geotechnical laboratory for physical testing if so indicated by its characteristics. The uppermost sleeve contents are to be discarded, unless otherwise indicated by the geologist.

9. Without disturbing the sample, seal the ends of each sample sleeve with Teflon sheeting and tightly fitting plastic end caps. The end caps shall then be held in place with silicone tape.

If another soil sample is to be collected at a greater depth in the same borehole, drill to the desired depth, reattach the split-barrel sampler to the drill rod assembly, and follow Steps 5 through 8 above. Be sure to decontaminate the sampler between samples.

10. Label sample sleeves using the sample numbering system described in the CTO-specific FSP and the sample identification numbers generated for the specific locations. The sample

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identification number for split-barrel samples shall include the sample depth, accounting for the appropriate incremental depth based on the location of the sleeve within the split-barrel sampler. Record other required field logbook information as specified in SOP 10.

11. Follow Steps 6 through 9 of Section 4.2.2.

4.4 Bulk Soil Sampling

Large volumes of soil are generally not required for environmental investigations. However, soil samples may be collected in bulk with a backhoe from test-pits or trenches to a maximum depth of approximately 15 feet (or the top of the groundwater table). A bucket auger may be used to collect bulk soil samples to maximum depths of 250 feet if the soils are unsaturated.

If bulk sampling is required for a given CTO, the procedure for sample collection will be provided in the CTO-specific FSP.

5.0 ATTACHMENTS

- A Tube Auger
- B Split-Barrel Sampler

SOIL SAMPLING

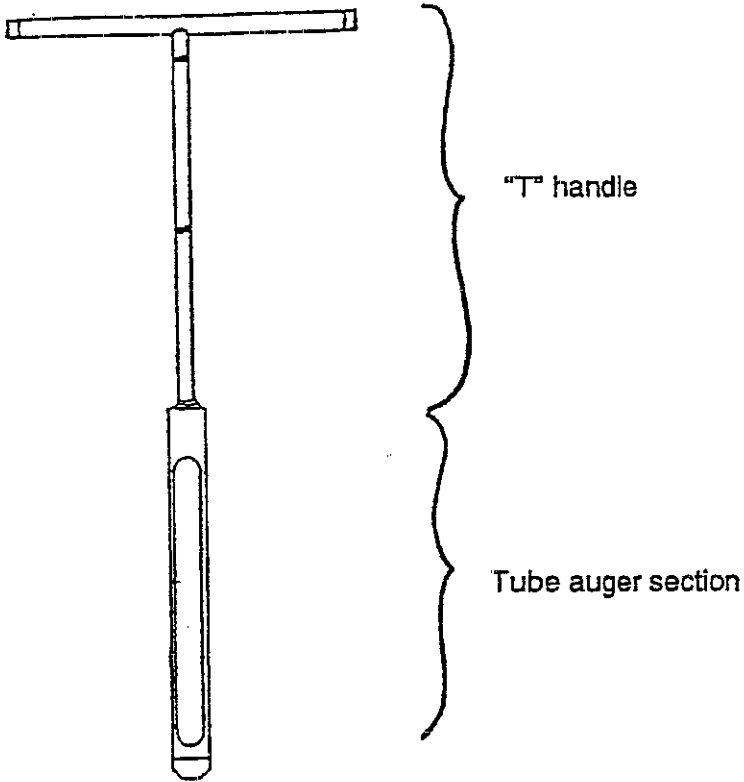
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Attachment: A

ATTACHMENT A TUBE AUGER

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Attachment: A

TUBE AUGER



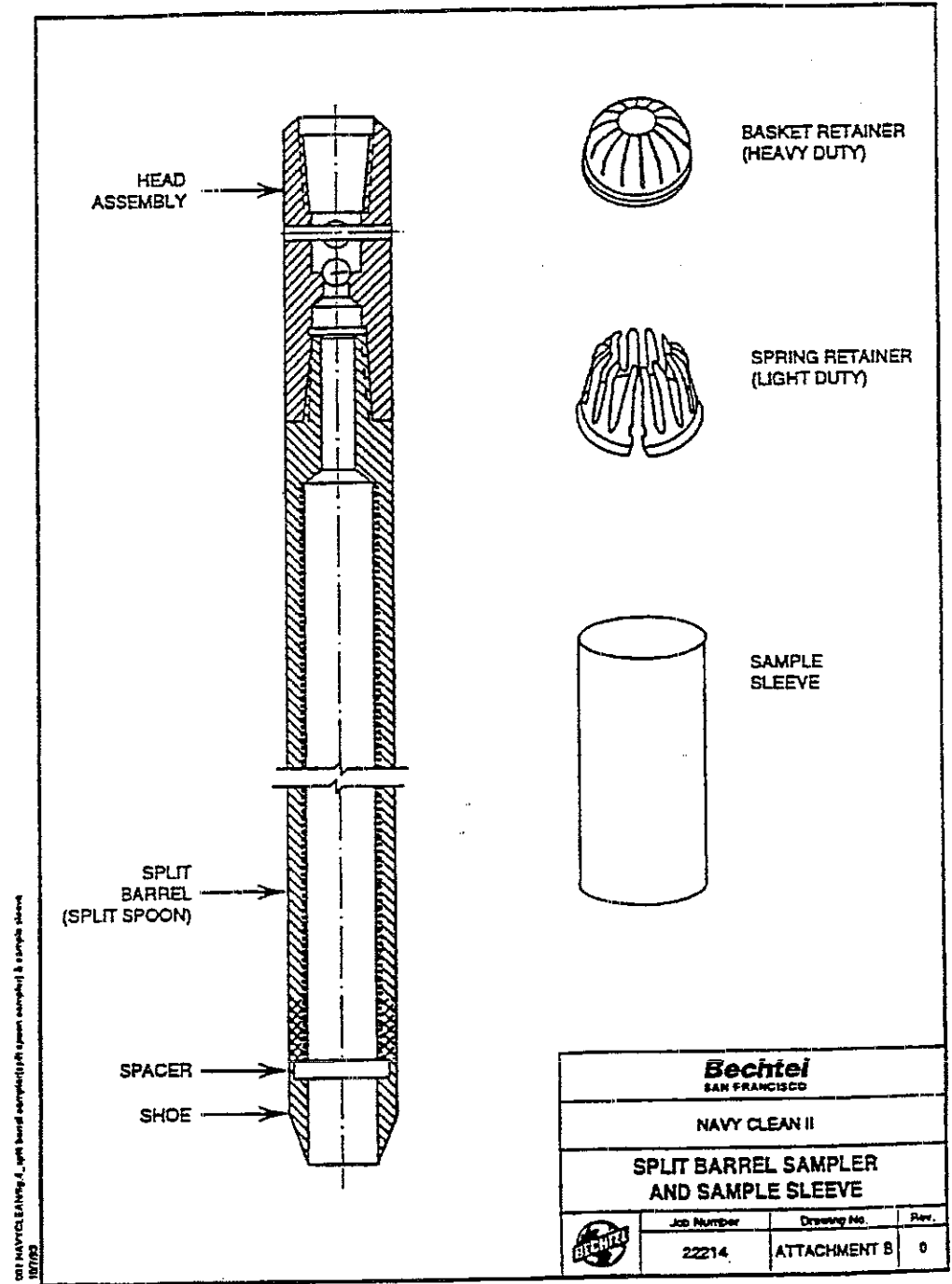
SOIL SAMPLING

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Attachment: B

ATTACHMENT B
SPLIT-BARREL SAMPLER

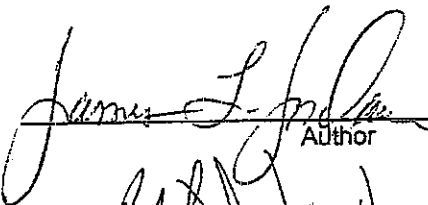

SOIL SAMPLING


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Attachment: B



Title: SAMPLE CUSTODY, TRANSFER, AND SHIPMENT
Document Number: SOP 10
Revision Number: 3
Reason for Revision: Add "Pay Items" to Section 5.1.1.1

Job No. 22214 (CLEAN II)
or
Job No. 23818 (CLEAN 3)

REVIEWED:  Author
 Functional Manager 12/13/01 Date

REVIEWED:  Quality Manager 12/31/01 Date

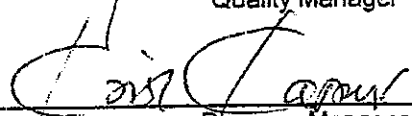
APPROVED:  Program Manager 12/31/01 Date

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SAMPLE CUSTODY, TRANSFER, AND SHIPMENT

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1.0 PURPOSE

This procedure describes protocols for the custody, transfer, and shipment of environmental and industrial hygiene samples from the point of collection to receipt by a designated analytical laboratory. The media constituting the environmental or industrial hygiene sample may include soil, rock, water, air, plant material, sludge, filter media, sorbent material, or impinger solution. The purpose of sample custody procedures is to ensure that the integrity of samples is maintained throughout the transfer process.

2.0 SCOPE

This procedure applies to all environmental and industrial hygiene samples collected by a Comprehensive Long-Term Environmental Action Navy (CLEAN) environmental engineer/geologist (field sampler) or health and safety representative, and submitted for analysis or archiving. This includes all transfers of samples through a shipping agent to a designated analytical laboratory or storage facility employee (sample custodian). This procedure is coordinated with Program Procedure T 2.2, Sample Information Management System.

3.0 DEFINITIONS

None.

4.0 REFERENCES

United States Environmental Protection Agency. 1986. NEIC Policies and Procedures.

———. 1987. Compendium of Superfund Field Operations Methods.

United States Department of Transportation (DOT) Regulations, Title 49, *Code of Federal Regulations*.

International Air Transport Association (IATA) Dangerous Goods Regulations.

National Institute for Occupational Safety and Health (NIOSH) Manual of Analytical Methods.

Standard Operating Procedure (SOP) 9, Sample Containers, Preservation, and Handling.

5.0 PROCEDURES

This procedure specifies the steps to be followed for correct documentation and execution of sample custody, transfer, and shipment. Section 5.1 defines sample custody and enumerates the elements constituting sample custody. Section 5.2 discusses sample transfer and shipment, and Section 5.3 discusses the special case of sample archival.

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5.1 Sample Custody

A sample is in the custody of a Navy CLEAN field sampler, shipping agent, or analytical laboratory employee/sample custodian if:

- it is in his/her possession;
- it is in his/her view, after being in his/her possession;
- it was in his/her possession and then placed under lock and key; or
- it is maintained in a designated secure area.

5.1.1 Field Sample Custody Procedures

The field sampler is personally responsible for the care and custody of the samples until they are transferred and/or shipped to an analytical laboratory or storage facility, in accordance with this procedure. The four elements of sample custody that are initiated in the field are sample labels, logbooks, chain-of-custody (COC) records, and custody seals. The following sections describe the proper procedures for completing each of these steps of the sample custody process.

5.1.1.1 Sample Labels

Sample labels convey information unique to each sample and thus serve to prevent misidentification of samples. The Bechtel field sampler shall attach a sample label to each sample container just before, or at the time of, sampling. Sample labels shall be weatherproof paper or plastic with gummed backs. Labels shall be completed with indelible ink, and, where necessary, the labels shall be protected from water with clear tape. Any errors made on a sample label shall be corrected as described in Section 5.1.1.5 of this procedure. Each sample label shall note the following information:

- project identification, sampling location, and job number;
- name or initials of field sampler (not preprinted);
- sample identification (ID) number;
- analysis required, pay item, and sample preservation (if applicable);
- sampling date; and
- the local standard time of sample collection, using a 24-hour clock notation.

An example of a sample label is included with this procedure as Attachment A.

5.1.1.2 *Logbook/Daily Field Report*

The field sampler is responsible for maintaining a logbook(s) that chronicles and summarizes all field activities performed during a given workday. Logbooks shall be permanently bound with numbered pages, and all entries shall be made in indelible ink. Should an erroneous entry be made, the error shall be corrected as described in Section 5.1.1.5 of this procedure. Logbooks shall include the following information at a minimum:

- sampling site (e.g., NBC Site 9);
- sampling location including distances to nearest fixed reference point(s);
- sampling depth (below ground surface [bgs], if applicable);
- sample matrix;
- sample appearance;
- volume of sample collected;
- field measurements (if applicable);
- type of sampling equipment used;
- names of all individuals present during sampling;
- sample collection dates and times, using a 24-hour clock notation;
- sample ID numbers;
- type and number of sample containers used per sampling site;
- designation of quality control samples (e.g., blanks, splits, or duplicates); and
- analysis required and sample preservation (if applicable).

Logbooks are intended to provide sufficient information to enable participants to reconstruct events that occurred during field activities. The notes allow interested parties, not present in the field at the time of sampling, to obtain insight into the field conditions surrounding any particular sampling event, as well as the methodology used by the field samplers. Logbooks are also admissible as evidence in legal proceedings. As such, the logbook entries should be factual, detailed, and objective.

See Section 4.2 of SOP 17 for additional guidance on logbook entries.

5.1.1.3 *Chain-of-Custody Record*

The field sampler shall fill out a COC record after each sample is collected. The COC record is necessary to physically trace sample possession from the time of collection to ultimate disposition. The record(s) shall be signed as relinquished

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or received each time the sample changes possession. The COC should be filled out once the sample is collected and shall contain the following information:

- contract task order (CTO) number;
- project name and sampling site (e.g., NBC Site 9);
- site contact;
- names of field samplers and their signatures;
- sample ID number;
- sampling date;
- local standard time of sample collection, using a 24-hour clock notation;
- sample matrix;
- description of the sampling location and depth (bgs), if applicable;
- number of containers submitted for each sample;
- pay items;
- analyses requested;
- turnaround time requested for analyses;
- preservation of sample containers (if applicable);
- name and address of analytical laboratory;
- means of transmittal to the analytical laboratory or storage facility (including carrier and airbill number, if applicable); and
- any general comments, instructions to the analytical laboratory, or unusual circumstances. These may include:
 - indication that a particular sample was split with an owner, operator, or government agency;
 - instruction to the analytical laboratory to spike a sample;
 - indication of problems encountered during an attempt to transfer a sample; or
 - lack of preservation due to sample reaction.

General comments, instructions to the analytical laboratory, or unusual circumstances shall be recorded in the COMMENTS/INSTRUCTIONS section of the COC. Any additional information unique to a particular sample shall be recorded in the REMARKS section of the COC. Should an error be made on the COC, the error shall be corrected as described in Section 5.1.1.5 of this procedure. A blank COC form is included as Attachment B.

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In the event that multiple analytical laboratories are used at a site, a separate COC record shall be completed for each laboratory or storage facility. Each COC record shall indicate the number of coolers transmitted to that particular laboratory or storage facility, in the NO. OF COOLERS SHIPPED block of the COC.

5.1.1.4 Custody Seals

After sample collection, a signed and dated custody seal shall be affixed to each sample. Custody seals are used to detect whether samples have been subjected to tampering following sample collection but prior to the time of analysis. The seal shall be attached in such a way that it is necessary to break the seal in order to open the sample container. Two or more custody seals shall also be affixed to the outside of the shipping container or cooler prior to shipment through an overnight carrier (e.g., Federal Express). An example of a custody seal is included with this procedure as Attachment C.

5.1.1.5 Error Correction

Any and all errors made on the sample label, in the logbook, or on the COC shall be corrected with a single line drawn through the error, followed by the entry of the correct information. The erroneous information shall not be obliterated. The individual making the correction shall then initial the correction and indicate the date on which the correction was made. If an error is discovered on a sample label that has been taped to protect it from water, the label shall be discarded and a new, correct label shall be affixed to the sample. Should an error be made on a custody seal, the seal shall be discarded and a new seal shall be affixed to the sample container. A description of any error correction made to the sample label or COC shall be entered in the logbook.

5.2 Sample Transfer and Shipment

The following subsections describe the proper procedures for sample transfer and shipment. Section 5.2.1 discusses the usual methods of sample shipment and the appropriate custody transfer procedures for each method. Section 5.2.2 identifies the items that should be considered and the arrangements that should be made for sample shipment.

5.2.1 Transfer of Custody for Shipment

The Bechtel field sampler is personally responsible for the care and custody of the samples until they are transferred and/or shipped to the analytical laboratory.

The COC, initiated by the field sampler during sampling, shall document only those samples it accompanies during shipment (i.e., the COC is the record of the contents of a particular cooler). All samples shipped shall be accompanied by a field-completed COC. There are usually two routes by which samples may be

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transferred to the analytical laboratory or storage facility. The two methods of shipping are:

- by land or air through an overnight commercial shipping courier, or
- by land through a non-commercial courier, field samplers, or other responsible party to whom the samples can be relinquished directly.

Method 1

When samples are transferred via the first method, the field sampler shall complete an airbill, provided by the overnight carrier, for the shipment of the samples. The field sampler shall indicate the name of the overnight carrier in the RECEIVED BY block of the COC, and the airbill number in the AIRBILL NO. block of the COC. The date and time of sample pickup shall also be noted. The field sampler shall keep the bottom two copies of the signed COC for field records, and the top copies of the COC shall be enclosed in a plastic zip-lock bag. The zip-lock bag shall be sealed and taped to the inside of the cooler lid or inside the packing box. Two or more custody seals shall then be affixed to the outside of the cooler or packing box, one on the front and one on the back. Additional seals may be used if the field sampler deems more seals necessary. The cooler shall be wrapped with clear tape over the custody seals to prevent the seals from falling off. The cooler shall be handed over to the shipping agent, typically Federal Express, along with the completed airbill. The top copy of the airbill shall be returned to the relinquishing party and should be retained for field records.

Method 2

When samples are transferred via the second method, the field sampler shall be responsible for relinquishing the samples to the delivering party. Both the field sampler relinquishing the samples, as well as the delivery person (shipping agent) receiving them, shall sign, date and note the time of transfer on the COC. The field sampler shall keep the bottom two copies of the signed COC for field records.

Refer to SOP 9, Sample Containers, Preservation and Handling, for a more detailed description on the packaging of samples for shipment.

5.2.2 Sample Shipment

The field sampler shall be aware of all governing state, federal (DOT and IATA), and local regulations concerning the shipment of environmental samples prior to the field sampling event. The field sampler shall also be aware of the shipping agent's limitations in this respect so that no time is lost due to a need to repackage and/or label the shipment.

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The Site-Specific Safety and Health Plan Supplement (SSHP) for the fieldwork will identify whether special procedures are to be implemented for the shipment of samples because of the potential presence of reportable quantities of "Hazardous Substances" as defined by the DOT Hazardous Materials Regulations. The SSHP will also identify whether the samples may meet "Dangerous Goods" criteria set forth by the IATA and/or other applicable shipper's requirements. If special procedures are to be implemented, the SSHP will define what these measures are, and how they affect the packaging, labeling, and shipping of samples and what training requirements are required.

Two program contaminants that have been determined to potentially meet special regulatory requirements in certain cases are polychlorinated biphenyls (PCBs) and arsenic. Whenever samples are expected to be contaminated with one of these substances, the following conditions will be implemented:

- Any field site suspected of producing samples containing PCBs at a concentration of 20 parts per million (ppm) or greater will have the applicable DOT training and shipping requirements implemented. Samples suspected of being contaminated with PCBs at levels below this regulatory limit need no special requirements if shipped by land or Airborne Express. PCB-contaminated samples (regardless of concentration) should not be offered for shipment by Federal Express, because to do so without the specified packaging is in violation of the IATA regulations.
- Since naturally occurring levels of arsenic are relatively high on the west coast, the Program Procedure requires that whenever arsenic is suspected to exceed natural background levels, and be present at a level of 20 ppm or more, special labeling and shipping requirements required by DOT will be implemented.

Both of the above determinations will be made at the time of the writing of the SSHP for the fieldwork. Both 49 *Code of Federal Regulations* 172 (c)11 and the IATA Dangerous Goods regulations allow historical data and the shipper's best judgment to be used to make this determination.

Training in the proper shipping of reportable quantities of arsenic and PCBs will be conducted for all field personnel who will be involved in the packaging and shipping of these materials on a task-specific basis. The training will be conducted by the Safety and Health Manager or other competent person. The training will be in accordance with the U.S. DOT HM-126F, and must occur only if target levels outlined above are anticipated.

The Readiness Review Checklist (see Program Procedure M 3.2) will ensure that these determinations have been made prior to mobilizing to the field and that special shipping arrangements have been made where appropriate.

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- Arrangements shall be made for transporting the samples to the laboratory before starting any sampling episode. If the samples are to be sent by overnight common courier, the proper arrangements shall include obtaining pickup service or determining where and when the samples can be dropped off. It may also be necessary to modify the sampling schedule to match the latest pickup/drop-off times for overnight delivery. The laboratory should be notified in advance if it is known that samples will arrive after normal business hours or on weekends.
- When shipping industrial hygiene-related samples (i.e., filter media or contained air), the appropriate NIOSH method shall be consulted for guidance in packing and shipping the containers or filter media.

5.2.3 Laboratory Sample Receipt and Custody Procedures

The designated sample custodian shall take custody of all samples upon their arrival at the analytical laboratory. The sample custodian is responsible for inspecting all sample labels and custody forms to ensure that the information is internally consistent. The custodian shall also inspect all samples for signs of damage or tampering. Any discrepancies in information or signs of damage or tampering shall be documented and noted on the COC by the custodian. The custodian shall then sign and date the COC for receipt.

The custodian shall assign a unique laboratory ID number to each sample and distribute the samples to appropriate analysts or secured storage areas. All sample transfers within the laboratory shall be recorded.

Laboratory personnel shall be responsible for the care and custody of samples from the time they are received for analysis until the samples are exhausted or returned to the laboratory sample custodian for disposal. If a portion of any sample must be sent to a second laboratory for analysis, the sample custodian shall be responsible for creating a new COC form to track the possession of this subset of samples. All procedures for sample custody, transfer, and shipment, as described in this procedure, shall apply during transfer of samples between laboratories. The laboratory shall retain all written records of laboratory handling and analysis as part of a permanent laboratory file.

5.3 Sample Archival

Custody of samples that are collected and archived for future chemical or physical analysis shall be documented in the same manner as described above. However, the ARCHIVE column will be annotated with the sample container number (Attachment B) by the field sampler. Sample receipt shall also be handled as described above with the receiving sample custodian indicating the condition in which the samples were received and signing the COC. Samples submitted for archival, other than environmental or industrial hygiene samples, could include borehole soil samples or rock core samples.

SAMPLE CUSTODY, TRANSFER,
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6.0 ATTACHMENTS

- A Sample Labels
- B Chain-of-Custody Record
- C Custody Seal

**SAMPLE CUSTODY, TRANSFER,
AND SHIPMENT**

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ATTACHMENT A

SAMPLE LABELS

SAMPLE CUSTODY, TRANSFER,
AND SHIPMENT

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BECHTEL NATIONAL, NAVY CLEAN II Site 9 – NASNI, CTO-147 Sample ID: 147G Sample Location: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5	BECHTEL NATIONAL, NAVY CLEAN II SITE 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5
BECHTEL NATIONAL, NAVY CLEAN II SITE 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5	BECHTEL NATIONAL, NAVY CLEAN II SITE 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5
BECHTEL NATIONAL, NAVY CLEAN II Site 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5	BECHTEL NATIONAL, NAVY CLEAN II SITE 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5
BECHTEL NATIONAL, NAVY CLEAN II SITE 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5	BECHTEL NATIONAL, NAVY CLEAN II SITE 9 – NASNI, CTO-147 Sample ID: 147G SAMPLE LOCATION: 40 ml VOA Project No.: 22214-147 Samplers: M. Walden, S. Anderson Initials Sample Date: _____ Time: _____ Preserv. HCL/Chill 4C Analysis: VOCS – W/TICS PAY ITEM: 1.5

ATTACHMENT B
CHAIN-OF-CUSTODY RECORD

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Word - Fill in the blank.

ATTACHMENT C
CUSTODY SEAL
Typical

SAMPLE CUSTODY, TRANSFER,
AND SHIPMENT

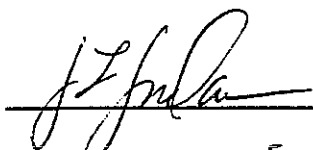
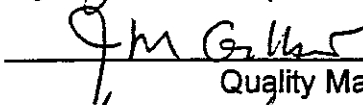
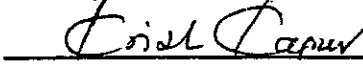
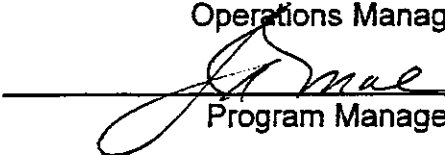
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CUSTODY SEAL

	Project Name: _____	Signature: _____
	Project Number: _____	Date: _____

Title: DECONTAMINATION OF EQUIPMENT
Document Number: SOP 11
Revision Number: 2
Reason for Revision: General Revision and To Modify Decontamination Procedure

Job No. 22214 (CLEAN II)
or
Job No. 23818 (CLEAN III)

AUTHOR: 
REVIEWED:  3-3-99
Quality Manager Date
APPROVED:  3/4/99
Operations Manager Date
APPROVED:  3/4/99
Program Manager Date

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DECONTAMINATION OF EQUIPMENT

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1.0 PURPOSE

This Comprehensive Long-Term Environmental Action Navy (CLEAN) Standard Operating Procedure (SOP) is applicable to the decontamination of field equipment that comes in contact with chemically contaminated (not radioactively contaminated) or potentially contaminated materials. It is based upon guidance given in the references (below).

2.0 SCOPE

This procedure aims to prevent:

- cross contamination among environmental samples;
- risk to personnel, or the environment, caused by the spread of contaminants; and
- harm to field equipment caused by contaminants.

This procedure is general in nature. Any more stringent decontamination procedures called out in site-specific Field Sampling Plans (FSPs) or in Site-Specific Safety and Health Plan Supplements (SSHPs) take precedence. Absence of such site-specific procedures necessitates this procedure to be followed.

This procedure is designed to be implemented on-site; at or near the field equipment point-of-use or at the border of a contamination exclusion area. Except in emergency circumstances, transport of contaminated field equipment off-site is forbidden. In a similar manner, storage of contaminated field equipment that has not been decontaminated either on-site or off-site is forbidden.

Contamination of field equipment does not have to be proven in order for decontamination to be required. A reasonable possibility or potential for field equipment to be contaminated is sufficient requirement for decontamination.

This procedure includes the minimum standards required for decontamination activities by subcontractors (Section 6.4, decontamination of drill rigs).

This procedure does not apply to field equipment that is intended for disposable, one-time use. Such equipment shall be containerized after use and kept containerized until disposed.

This procedure does not apply to personnel decontamination (body, personal protective equipment [PPE], or clothing), which is covered in Program Procedure SH 4.3, Personnel and Equipment Decontamination.

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3.0 DEFINITIONS

Decontamination: The process of removing contamination from persons or objects.

SSHR: Site Safety and Health Representative. Person responsible for safety and health of personnel at the site.

4.0 REFERENCES

Naval Equipment Management Facility (NEMFac) User's Guide, January 1998.

U.S. EPA. 1993. Preparation of a U.S. EPA Region IX Sample Plan for EPA-Lead Superfund Projects. San Francisco, California: Quality Assurance Management Section (QAMS), U.S. EPA Region IX.

The following Navy CLEAN Program SOPs and Program Procedures are applicable.

SOP 4, Soil Sampling

SOP 5, Monitoring Well Design, Installation, and Development

SOP 6, Instrument Calibration and Use

SOP 7, Water and Free-Product Level Measurement in Wells

SOP 8, Groundwater Sampling

SOP 13, Abandonment of Boreholes and Wells

SOP 14, Aquifer Testing

SOP 15, Marine and Deep Freshwater Sediment Sampling

SOP 19, Shallow Freshwater Sediment Sampling

SOP 22, Investigation-Derived Waste Management

Program Procedure SH 4.3, Personnel and Equipment Decontamination

5.0 PROCEDURE

5.1 Preventing the Need for Decontamination

Whenever possible, field equipment should be transported or stored in containers that prevent contamination.

Aluminum foil is a good material for wrapping clean equipment.

Polyethylene (PE) sheet material (Visqueen™) can be used as a barrier between sources of contamination and field equipment. PE sheets can be used as horizontal underlay (as a floor), horizontal overlay (as a roof or tent), or vertically (as a wall). Note: PE can be a source of phthalates if semivolatile analysis of rinsate is anticipated.

To minimize the potential for cross contamination, sampling activities should be planned to proceed from least contaminated locations to most contaminated locations.

"Disposable equipment" intended for one-time use shall not be decontaminated after the use, but shall be put into a suitable container and disposed as investigation-derived waste (IDW).

5.2 Equipment and Materials for Field Equipment Decontamination

Prior to initiating field operations, the necessary decontamination equipment shall be acquired. The FSP shall identify the chemicals of concern and describe decontamination protocols. Typical equipment requirements may include:

- buckets or tubs to hold wash and rinse solutions;
- long-handled, soft bristle brushes for scrubbing;
- nonphosphate detergent such as Alconox® or Liqui-Nox®;
- potable water supply or pump spray apparatus;
- nonreactive wash bottles for nitric acid solutions, solvents, and rinse water;
- towels or wipes;
- Department of Transportation drums to hold waste decontamination solutions and equipment;
- Visqueen (sheet PE) for laydown in decontamination areas; and
- gloves, aprons, safety glasses, and any other PPE required in the SSHP.

A formal decontamination station may be required between a contaminated area and a contamination exclusion zone. For greatest efficiency, placement and use of such a station shall be coordinated with the sampling or other field activities.

5.3 Generic Decontamination Procedure

The four steps to decontamination of equipment are as follows:

- remove gross (visible) contamination,
- remove residual contamination,
- prevent recontamination, and
- disposal of contaminants.

5.3.1 Remove Gross Contamination

Gross contamination removal may be accomplished by steam or high-pressure hot water cleaning and/or vigorous brushing with a nonphosphate detergent or by soaking and brushing. The method chosen shall consider the type of

equipment being decontaminated (e.g., drilling tools or electronic equipment) and the contaminating medium.

5.3.2 Remove Residual Contamination

Residual contamination removal consists of a formal set of steps based on the contaminants (present and suspected). Since the subject contaminants are often visible, these steps must be meticulously applied to the entire surface area of each piece of equipment suspected of coming in contact with contamination.

The following generic procedure is recommended by U.S. EPA, Region IX for EPA-Lead Superfund Projects (U.S. EPA 1992). This constitutes a model method that may be modified for specific applications.

NOTE: The nitric acid rinse may not be appropriate for metal-containing sampling devices if relatively low metal concentrations are anticipated. In such cases, nitric acid use (if any) should be directed in the FSP.

A pesticide-grade solvent that will not interfere with subsequent analysis may be used. Reagent grade methanol or isopropanol are commonly used for the organic solvent rinse. Methanol is more flammable than isopropanol and Department of Transportation regulations more stringent.

Liqui-Nox (or other nonphosphate-containing detergent) should be used when phosphate may be detrimental to the analysis. Alconox (or other phosphate-containing detergent) can be used if a stronger detergent action is required and phosphate is not detrimental to the analysis. Liqui-Nox and Alconox (manufactured by Alconox, Inc.) have enjoyed wide use historically, but any similar detergents can be used.

Residual contamination removal steps are as follows:

1. low or nonphosphate detergent wash (e.g., Alconox or Liqui-Nox solutions made up as directed by the manufacturer);
2. potable water rinse;
3. 0.1N nitric acid rinse (when cross contamination from metals is a concern and when specified in the FSP). Nitric acid should be at least American Chemical Society (ACS)-certified grade. Add 7 to 8 milliliters of concentrate (15 – 16N) nitric acid to 1 liter of deionized or distilled water to make 0.1N nitric acid. DO NOT ADD WATER TO ACID;
4. deionized or distilled water rinse;
5. pesticide-grade solvent (e.g., methanol) rinse (when semivolatile and nonvolatile organic contamination may be present **AND** when specified in the FSP); and
6. deionized or distilled water rinse (twice).

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(NAPLs) have accumulated. It is important to recognize that just a few drops of a NAPL could contaminate a well.

Care shall be taken on the ground surface to avoid introducing gross contaminants to wells. Tapes, hoses, and wires should not be permitted to lie on the ground or on contaminated surfaces. If such items become contaminated by ground contact, they must be decontaminated prior to use.

Equipment may be protected by hose reels, plastic sheeting, or plastic tubs.

Appropriate rinses or wipes shall be conducted prior to inserting devices into wells and as they are moved from wells. Manufacturer's instructions shall be consulted for decontamination of pumps and interface probes. NOTE: Certain materials may be susceptible to damage from organic solvents and/or acidic solutions.

6.4 Decontamination of Subcontractor Drilling Equipment

Drilling equipment decontamination shall be performed by the subcontractor, in accordance with the applicable FSP or SSHP.

Decontamination is required for equipment involved in drilling and/or sampling soil borings and monitoring wells. It is required for development rigs involved in developing, purging, sampling, or aquifer tests. It is also required for any other equipment (e.g., backhoes or rigs that drive points or penetrometer cones) that might come into contact with contaminated media or expose media to be sampled with contamination carried onto a site.

Decontamination is required for all rig components that touch or enter the ground. Decontamination may also be required to parts of the drill rig vehicle that become splattered with boring materials. Drill rig vehicle decontamination should be conducted on decontamination pads or in designated decontamination areas (typically a depression lined with a PE sheet) located close enough to the work site that contamination is not spread during the movement of the vehicle. Gross decontamination is removed at the work site prior to moving the vehicle to the decontamination pad.

Vehicles and downhole drilling equipment shall be decontaminated prior to moving onto the site, between each drilling location, and prior to leaving the site.

Decontamination shall consist of steam or high-pressure hot water wash, nonphosphate detergent, and a potable water rinse. Organic solvents, such as methanol may be required to remove heavily oiled residues. Where the potential for cross contamination/transference exists, the SSHR shall approve all daily vehicle movement off-site after confirmation that the vehicle has been satisfactorily decontaminated.

The vehicle operator shall take steps to prevent contamination of the vehicle interiors. All equipment necessary for work shall be removed from the cab interior prior to start of work.

7.0 QUALITY CONTROL

The final rinse solution of an equipment decontamination can be collected and analyzed. Such samples are referred to as rinsate samples. The number, frequency, and method of collection of rinsate samples will be described in the FSP.

8.0 DECONTAMINATION SAFETY AND HEALTH ASPECTS

Material Safety Data Sheets are required for all chemical decontamination agents (except water) brought on-site. Use of acids, solvents, etc., other than specified in this procedure requires the approval of the CLEAN Safety and Health Program Manager.

Requirements for PPE decontamination are established in the SSHP and enforced by the SSHR.

CLEAN personnel shall not operate subcontractor decontamination equipment unless that equipment is provided specifically for their use and personnel have been trained in the use of that equipment.

9.0 DOCUMENTATION

Decontamination of field equipment, including drilling equipment, shall be documented in a field logbook. Typical decontamination of field equipment can be documented with a single entry. All deviations and reasons for deviations from normal decontamination procedures shall be noted and initialed in the field logbook.

9.1 Certification of Decontamination

Equipment to be returned to the custody of the government (NEMFac) or the CLEAN office shall be decontaminated. As required by the NEMFac Guide, a certificate of decontamination (Attachment A) shall be completed by the user and signed by the SSHR and the CTOL (or designee).

10.0 ATTACHMENT

A Certificate of Decontamination

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical analysis performed.

3. The third part of the document presents the results of the study. It includes a series of tables and graphs that illustrate the findings of the research. The data shows a clear trend of increasing activity over time.

4. The fourth part of the document discusses the implications of the findings. It suggests that the results have significant implications for the field of study and may lead to further research in this area.

5. The fifth part of the document concludes the study. It summarizes the key findings and provides a final statement on the importance of the research.

ATTACHMENT A
CERTIFICATE OF DECONTAMINATION

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY
Certification of Decontamination for Release

Contract No. _____ Job No. _____ SSHR _____ Contact Phone _____
CTO No. _____ Site No. _____ Site Name _____
Base/Activity _____ Site Location Description _____

The items of equipment listed below have been decontaminated in accordance with the site safety and health plan. Each item was visually inspected or tested as noted below. Refer to the Survey Record Log or Daily Field Log for additional information concerning these items.

Owners/Government Equipment Piece No.	Item Description	Owner	Final Use Date	Item Tested For: or (visual)	Final Survey Record Log No./Date

The items listed above have been inspected following decontamination and are approved for unconditional release.

Approved:

Site Safety and Health Representative (Print Name) (Signature) (Date)

Reviewed:

Contract Task Order Leader (Print Name) (Signature) (Date)

Reviewed:

Safety and Health Supervisor (Print Name) (Signature) (Date)

Items which cannot be opened for inspection and were not packaged or sealed before entry into controlled areas shall not be released unconditionally.

Title: LOGBOOK PROTOCOLS

Document Number: SOP 17

Revision Number: 2

Reason for Revision: Two Year Review

Job No. 22214 (CLEAN II)

or

Job No. 23818 (CLEAN 3)

AUTHOR:

Scott Proctor

Author

REVIEWED:

Jon M. Gilber

Quality Manager

5-23-00

Date

APPROVED:

DISC Cooper

Program Manager

5/23/00

Date

advised that form borders and entries should be at least 1 inch from the edge of the bound side to allow for copying.

Note: A page consisting of multiple non-carbon reproducible (NCR) sheets (which function the same way as carbon copies) can be used. Writing on the top sheet (which does not tear out), transfers to the underlying sheets. All such sheets for a given page must have the same page number (see discussion below).

5.2 Precautions to Prevent Entry Compromise

Pages in a field logbook shall be **consecutively numbered** prior to any entry. Commercially available or custom hard-bound logbooks without page numbering must be consecutively numbered before any entry is made.

Once the field logbook is constructed, **pages shall not be removed or inserted**.

A field logbook shall **never be broken apart** (which will make copying easier).

Entries shall be made using **indelible ink pens**. Indelible means that the ink will not fade or run when rinsed with water, and will not smear. If in doubt, an ink can be tested (on a similar material) for running and smearing 30 minutes after a test entry is made. The traditional ink color is black. If another color ink is chosen, it should be reproducible on the photocopy machines available.

To correct errors, draw one solid line through each incorrect entry, initial and date each correction, and provide a written explanation if necessary. Use of correction fluids, obliteration (writing over the whole area), erasures, paste-over pages, and page removals are prohibited.

Field logbooks shall be **protected from damage and contamination**. If a field logbook is contaminated with a hazardous material, the Field Health and Safety Supervisor shall determine disposition.

5.3 Field Logbook Format

5.3.1 Field Logbook Cover

A field logbook front cover shall be clearly and indelibly marked with the following information, at minimum.

- The words, "CLEAN II FIELD LOGBOOK."
- Appropriate CTO number.
- Site location: name of CTO site, nearest city, or area, and state. If the field logbook applies to multiple sites, include all of them.

- Date of first and last entries in the field logbook. The field logbook user completing a field logbook writes the date of the last entry in the field logbook on the cover.
- Field logbook number. The field logbook number shall include the CTO number and other alphanumeric characters (up to a maximum of 16) to make it unique (this is a database entry requirement).
- If possible, the field logbook number shall be clearly and indelibly marked on the spine of the logbook.

An example of a field logbook front cover that meets the above criteria is included as Attachment 1.

5.3.2 Field Logbook Spine

If physically possible, the field logbook number shall be indelibly marked on the spine of the field logbook. This aids identification of the field logbook recognition when the logbooks are in storage.

Some field logbooks spines will be narrow or made of materials that are not easy to write on. In these cases, the field logbook number can be written on a strip of adhesive tape and the tape applied to the spine.

5.3.3 Field Logbook Users List

There shall be a list of **field logbook users (authors and reviewers)** located near the front of the field logbook. Every field logbook user who makes an entry in the field logbook should be listed. Each field logbook user need only be listed once.

At a minimum, the list will include (by row) the **printed name** of the field logbook user, the **signature** of the field logbook user, and the **initials** of the field logbook user.

5.3.4 Table of Contents

A table of contents shall be located near the front of the field logbook.

When a field logbook is a collection of forms, a listing of the type of forms can serve as a table of contents.

5.4 Field Logbook Entries

5.4.1 Entry Content

Entries made by the field logbook user can include historical or chronological information (minute to minute), or observational data (including both direct observations of fact or the indirect observation of data as recorded by an instrument).

Examples of entry content are:

- narratives of field activities such as drilling and sample collection (usually these are in chronological order),
- field instrument measurements,
- observations on weather condition changes,
- descriptions of problems encountered and resolutions found, and
- listings of site visitors; it is important to record on-site visits by nonfield team personnel who request changes in activity, impact the work schedule, request information, or observe team activities (include date, time, purpose of visit, and summary of conversations, if any).

Because field logbooks are the bases for subsequent written reports, entries shall be legible, understandable, and complete.

If the field logbook user's writing is not legible, entries should be printed.

Field logbook users should consider their potential readers and plan the arrangement and presentation of an entry so that it is clear and understandable.

Entries shall include **sufficient detail** such that understanding is complete from the reading and reliance on memory is not required. All gathered data should be entered, not just selected parts.

Blank portions of pages and unused pages shall be filled by drawing a diagonal line across the portion or page, and initialing.

All measurement data shall be recorded in **appropriate units** and in sufficient detail to allow subsequent data collection to continue with the same degree of accuracy.

All **abbreviations and acronyms shall be defined**. This can be done at each instance, or a logbook page(s) can be dedicated to abbreviations and acronyms used throughout the logbook. In forms and tables, the abbreviation "NA" (not applicable) should be used where no entry is required.

Instrument measurement data (e.g., a piece of strip chart data, a map, or a photograph) can be securely attached (stapled, taped, etc.) to a field logbook page. The attachment shall have a title printed on it and must be referenced in the logbook text.

5.4.2 Entry Beginning and Ending

The **beginning and ending of every entry shall be clearly apparent** to a reader. This allows each entry to be separate from any others on the basis of authorship, time, subject, etc. Various devices can be employed for this purpose.

- It is common practice to begin a new entry on a new page.
- For handwritten entries, it is common practice for the field logbook user to begin a new entry with a date (and/or time) and to end an entry with a signature.
- Titles on forms can signal a new entry beginning.
- Printed or stamped headers can signal a new entry beginning. The CLEAN II Program office in San Diego can provide a standard header stamp.

5.4.3 Authorship, Location, and Time

Authorship of each entry shall be apparent to the reader. This means that the signature of the field logbook user must appear as part of the entry.

Reference time of each entry shall be apparent to the reader. At a minimum, the date of the entry shall be given. If pertinent, the time of day shall also be given. Time shall be given in the military manner based on a 24-hour day.

Reference location of each entry shall be apparent to the reader. It can be assumed that an entry relates to the location as given on the cover of the field logbook. If this is not true, the location pertinent to the entry shall be given.

5.4.4 Entry Relation and References

Field logbook entries may relate to entries in other field logbooks. This is particularly true for projects with multiple tasks. Related entries should be cross-referenced.

If a field logbook is one in a series, this relationship can be indicated on the cover (of all field logbooks in the series) as follows:

Book No. _____ of _____.

Field logbook entries can refer to other publications (e.g., an instrument manual). Such references shall be complete (author; title of article, book, etc.; publisher, if any; volume, if any; and date of publication).

5.5 Field Logbook Custody

5.5.1 Custody

Once an initial entry is made, a field logbook shall be kept in custody.

Custody, as the word relates to court evidence means physically on one's person, within one's sight, or in a secure place where tampering would be unlikely (e.g., a locked drawer or a locked vehicle).

Custody as the word pertains to a field logbook means:

- logged into a secure place (presumably locked) at the project site or project office (CTO Leader has custody).
- logged out to a field logbook user who has it on his/her person,
- logged out to a field logbook user who has it in his/her sight. This can be when the field logbook user and the field logbook are together in a vehicle, in an office, or at the project site. For large project sites, the CTO Leader may impose more stringent requirements.
- logged out to a field logbook user who has it in a secure place. This can mean in a locked drawer at an office, in a locked vehicle, or at the project site. Note: This option (field logbook user has custody) is different than when the field logbook is "logged in" (CTO Leader has custody).

5.5.2 Custody Documentation

The CTO Leader shall maintain a Field Logbook Custody Log for all logbooks. The Field Logbook Custody Log shall be a separate document (not a part of any logbook) kept in a secure place.

All transfers from CTO Leader custody to a field logbook user and back shall be documented in the Field Logbook Custody Log. A field logbook user will assume custody of a field logbook by making an entry (including a signature) in the Field Logbook Custody Log. A field logbook user will relinquish custody back to the CTO Leader by making another entry (including signature of CTO Leader or designee).

Note: Regardless of the number of field logbooks issued, a CTO Leader that issues field logbooks is required to keep a Field Logbook Custody Log.

5.6 Periodic Field Logbook Reviews

5.6.1 Review Frequency

At least every 30 days, the CTO Leader, or designee, shall periodically review each field logbook pertaining to activities under their supervision.

5.6.2 Review Coverage

A field logbook review shall as a minimum cover technical content, accuracy, reasonableness, consistency, and compliance with this SOP.

5.6.3 Review Documentation

Upon completion of the review, the reviewer shall make an entry in the field logbook following the most recent field logbook user entry. The entry, at a minimum, shall consist of the word "Reviewed," printed name of reviewer, title, (e.g., CTO Leader), signature, and review date. If a field logbook is divided into separate sections, the reviewer shall make an entry for each section with new entries since the last review.

In lieu of this approach, a Reviewer's Signature Sheet can be added to the front of the logbook to document reviews. This sheet should contain the following: printed name of reviewer, title, signature, and review date.

5.6.4 Discrepancies or Omissions

Discrepancies or omissions found during review, shall be resolved between reviewer and appropriate field logbook user(s).

Corrections and additions shall be dated and initialed by the field logbook user and/or reviewer as appropriate.

5.7 Field Logbook Backup

5.7.1 Photocopying

The CTO Leader decides how often a field logbook is photocopied. The CTO Leader should maintain a regular photocopying schedule for important field logbooks that could become lost or damaged. The use of perforated NCR sheets for a page can greatly reduce the work that copying requires (see Section 5.1).

5.7.2 Field Logbook Restoration

When a field logbook is lost or destroyed, photocopies of a field logbook or accumulation of NCR sheets can be restored to equivalence of the original field logbook (as far as defense in court) if:

- the photocopy or NCR page collection contains an explanation as to loss of original, photocopying, and copy custody;
- the photocopy or NCR page collection contains all of the pages of the original that contained entries;
- the photocopy or NCR page collection remains in custody equivalent to that required for the original;
- all field logbook users provide their signatures and initials (a new Field Logbook Users List) to the collection; and
- each photocopy page or carbon-copy page contains the initials of all field logbook users that made entries on the page of the original field logbook. This requires a resigning; the old signature on the photocopy or NCR page is not sufficient.

5.8 Closing A Field Logbook

5.8.1 Closing

The CTO Leader shall decide when a field logbook is no longer required and direct it to be closed. Closing must be done in such a way that **any new entries made after closing would be apparent to a reader.**

5.8.2 Final Review

The CTO Leader shall review all completed field logbooks. Upon completion of a field logbook review, the CTO Leader will sign and note the closeout date of the logbook on the cover sheet of the logbook or on a review signature sheet.

The CTO Leader or designee shall perform a final review. Upon completion of the review, the reviewer shall make an entry following the last field logbook user entry and/or after the last table of contents line and/or on the front cover.

If a Reviewer's Signature Sheet has been used, a final entry shall be made. The entry, at a minimum, shall consist of the words, "Review completed, logbook closed," followed by the printed name of reviewer, title, signature, and review date.

All unused spaces or pages shall be lined (diagonal lines) out and initialed.

5.8.3 Final Disposition

After final review, closed field logbooks shall be transmitted to the Project Document Control Center (PDCC) in San Diego. PDCC shall retain, file, and maintain a log of all completed field logbooks.

5.9 Responsibilities

5.9.1 CTO Leader Responsibilities

The CTO Leader is responsible for:

- assuring overall compliance with this procedure;
- designating a Quality Representative for the CTO (Note: This is a requirement of the Quality Control Management Plan);
- obtaining, formatting, custody, and turn in of CTO field logbooks;

EXAMPLE FIELD LOGBOOK COVER

NAVY CLEAN II
PROGRAM FIELD LOGBOOK

CTO186

SOIL BORINGS

LA VACA, CA




FROM: 02/04/92

TO: 03/28/94

LOGBOOK NO.

186--001

Job No. 22214 (CLEAN II)
or
Job No. 23818 (CLEAN 3)

	Author	
REVIEWED:		11/22/00 Date
	Functional Manager	
REVIEWED:		11-20-2000 Date
	Quality Manager	
APPROVED:		11/27/00 Date
	Program Manager	

1.0 PURPOSE

This Standard Operating Procedure (SOP) is intended to provide program-wide instructions on the management of investigation-derived waste (IDW) generated during Comprehensive Long-Term Environmental Action Navy (CLEAN) Program Contract Task Order (CTO) field activities. Although this SOP outlines the preferred methodology, the Program understands that specific situations may warrant other handling and disposal options. As a result, this SOP instructs each CTO to have a site-specific IDW Management Plan (IDWMP), which will provide the site-specific details of issues such as the areas to be investigated, the contaminants of potential concern, the waste types and volumes to be generated and specific handling and disposal options. The guidance for the preparation of the site-specific IDWMP is provided in Section 5.2 of this SOP.

2.0 SCOPE

Field investigation activities result in the generation of waste materials that may pose a risk to human health and the environment or may be determined (after sampling and analysis) to be United States Environmental Protection Agency (U.S. EPA) Resource Conservation and Recovery Act (RCRA) hazardous wastes. These IDWs may include, but are not limited to, drilling muds, soil cuttings, and purged groundwater; residues from the testing of treatment technologies/pump and treat systems; contaminated disposable personal protective equipment (PPE); laboratory residual wastes; and wash and rinse water, solutions, or chemicals used to decontaminate nondisposable protective clothing and equipment.

This SOP does not provide guidance for the handling and disposal of radioactive and mixed-waste materials.

3.0 DEFINITIONS

CLEAN Contractor: Bechtel National, Inc. (BNI) provides program management and technical environmental services in support of the Navy Environmental Engineering Program at installations under the jurisdiction of the Southwest Division Naval Facilities Engineering Command (SWDIV). As such, BNI will conduct field investigation activities that may result in the generation of IDW.

Waste transportation and disposal subcontractor: The programmatic waste disposal subcontractor will provide services including, but not limited to, the handling, sampling, and profiling; review of analytical information; and transportation and disposal of IDW.

Generator: The generator of the IDW under the CLEAN program is the Department of Defense (DoD). The DoD is responsible for the execution of IDW profile and manifest documentation, and the ultimate record keeping of all IDW disposal. For the purpose of transportation and disposal of IDW, the individual bases under DoD should have their own U.S. EPA and state generator ID numbers.

5.1 Cost Proposal Planning

Planning for IDW management should begin in the cost proposal phase. A cost proposal with field activities should include an estimate for the preparation of a site-specific IDWMP; for materials, services, and equipment required to manage IDW during field activities; for sampling and analyses; and for IDW off-site transportation and disposal services. Based on the sampling and investigation methodology, estimate the volume of IDW to be generated during field activities. Assure that the drilling subcontract includes all equipment necessary for the drilling subcontractor to handle IDW. The program waste disposal subcontractor is available to assist in determining the costs associated with IDW handling and disposal.

5.2 Post Award Activities

- Identify the IDW coordinator who will work with the Field Services Manager, and the individuals in the field, to assure the appropriate handling and disposal of IDW.
- Identify the on-site DON contact for IDW issues. This person(s) should be included in the site-specific IDWMP as the appropriate DON contact for signing waste profile and manifest documentation.
- Establish the IDW interim storage location (e.g., centralized, fenced, locked, paved, secure location away from public view, away from ecologically sensitive areas and not adjacent to any open ditch, drain, or trench that could lead to an open waterway or storm drain). In addition, when choosing a location for IDW interim storage, review the proposed physical location to determine if the area is accessible to large trucks and not located on a hill or in sand. The IDW interim storage location should be identified with signs that say:
"KEEP OUT - AUTHORIZED PERSONNEL ONLY"
"NOTICE - IDW INTERIM STORAGE AREA"
"NOTICE - THIS AREA IS FOR BNI AND THEIR SUBCONTRACTOR USE ONLY. FOR ACCESS OR TO REPORT CONDITIONS INSIDE THIS AREA, CONTACT:"
See Attachments I-1, I-2, and I-3 for samples of these signs. The Program Health and Safety personnel can provide copies of these signs for you.
- A spill kit must be located and maintained within the interim storage location.
- No movement or transportation of IDW is allowed on public roadways. The movement or transportation of IDW is allowed within a federal facility because these roadways are not under the jurisdiction of the Department of Transportation (DOT). If IDW is to be generated or transported outside the base perimeter, contact the waste disposal subcontractor to determine the appropriate protocol for handling this IDW. The waste disposal subcontractor

- Assure that the site-specific IDWMP has been reviewed and approved by the DON and agencies.
- Prepare IDW input for readiness review process. The readiness review process should include a consultation with the waste disposal subcontractor, which may also include a field visit to view the IDW interim storage location.
- Notify in writing, or by E-Mail, the Field Services Manager of intended field activity work effort and schedule.

5.4 Handling IDW During Field Activities

- Attachment E is a flowchart illustrating the Program IDW handling and disposal preferred methodology as referenced in this SOP. This process has been developed to assure disposal of IDW within 90 days of generation. This 90-day limit is very important. The 90 day limit begins on the date that IDW is first put into the container (that date is entered onto the IDW label at that time). If a container of IDW is sampled and analyzed; and the IDW is found to be "hazardous waste" as defined by U.S. EPA RCRA (40CFR261 or California Code of Regulations Title 22, Division 4.5), the DON is the hazardous waste generator (40CFR262) of that waste. Under RCRA, a generator that does not transport hazardous waste within the 90-day limit can suffer serious penalties. The success of this process depends on the close coordination between the CTO Leader, Field Services Manager, IDW coordinator, waste disposal subcontractor, PMO contracts group personnel, and the DON. The Field Services Manager is available to assist and facilitate actions when problems are encountered or anticipated.
- If field activities occur for a period longer than 30 days, the IDW process shall be implemented in phases to allow specific quantities of IDW to be managed and disposed of in a timely fashion.
- Limit IDW placed in drums to actual soil-related IDW generated during sampling and field investigations. Drilling and/or demolition subcontractors employed on-site during field activities should be responsible for their own debris (regular trash, construction debris, and nonhazardous drilled concrete).
- Do not remove gaskets from the drum lids of steel drums (e.g., DOT 17H container) used to store IDW.
- Collect, label, and store IDW in the appropriate containers. The waste disposal subcontractor is available to advise CLEAN personnel as to which containers are best used for the type of IDW to be generated (e.g., soils, liquids, laboratory residual wastes). Using the appropriate containers in the field will assure safe and cost-effective IDW disposal.
- Attachment F is an example of the IDW label to be affixed to a container. The label color should be black and white (black lettering on white background) and weather resistant. NOTE: NO BECHTEL EMPLOYEE SHOULD INITIAL OR

waste disposal subcontractor to determine when the final report will be submitted to the PMO. Once the date has been established, follow up and assure the report goes to the PDCC and DON.

6.0 ATTACHMENTS

- A Site Specific IDWMP Table of Contents
- B CTO-Specific IDWMP Development
- C IDW Information Form
- D Request For Delivery Order
- E IDW Handling and Disposal Processes
- F IDW Label
- G Container Inventory Log
- H IDW Inspection Log
- I Signs

Site-Specific IDWMP
Table of Contents

1.0 Introduction

[Site background - location, brief summary of what contamination was found in previous investigations. Include whether or not it is an NPL site.]

Navy contacts (e.g., RPM, RTM, ROICC, Base POC, etc.)

2.0 Waste Generation

[Type of IDW expected during field investigations - e.g., liquid, soil, PPE; and estimated volume to be generated]

3.0 Applicable Regulatory Requirements

Federal
State
Local
DON procedures and/or policies

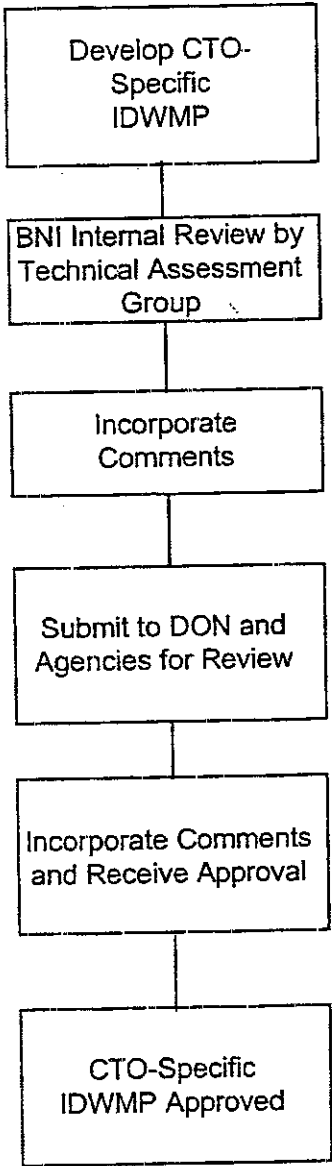
4.0 Waste Handling and Disposal

- Storage, containers, and labeling (include map of interim storage location)
- Sampling and laboratory analyses
- Waste characterization
- Transportation and disposal options
- Generator information (e.g., generator ID no., representative who will sign manifest documentation)
- Inspection interval
- Health and Safety
[The supplement to the Site-Specific Health and Safety Plan outlines the precautions to be taken during IDW handling in the field.]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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INVESTIGATION-DERIVED WASTE MANAGEMENT

Navy CLEAN SOP: 22
Rev: 1
Date: 11/07/00
Attachment B Page: 1 of 1



NAVY CLEAN II
Investigation Derived Waste (IDW) Information Form

CTO No. _____ Site Name _____ Superfund Site? ☐ Yes ☐ No

Bechtel Contact Person _____ Phone No. _____
Mailing Address _____

Site Address _____ EPA ID # _____

_____ CA State ID # _____

Navy Generator Mailing Address _____

Site History (Source of contamination) _____

Site Map (with IDW container locations) attach to this form

Type of Sampling Completed (i.e., mud rotary, hollow stem auger) _____

Scope of Work (i.e., collect and move IDW drums to storage yard, dispose of IDW, clean Baker tank, etc.) _____

IDW Information: (Attach additional pages if necessary)

INVESTIGATION-DERIVED WASTE MANAGEMENT

Navy CLEAN SOP: 22
Rev: 1
Date: 11/07/00
Attachment D Page: 1 of 1



NAVY CLEAN II PROGRAM
JOB 22214
PRIME CONTRACT: N68711-92-D-4670

PRELIMINARY

REQUEST FOR DELIVERY ORDER

TO: _____ FROM: _____ DATE: _____
REQUIRED SERVICES: _____ REQUISITION NO.: _____
CTO NO.: _____ SITE: _____ COST CODE: _____

THE FOLLOWING QUANTITIES ARE REQUESTED:

PAY ITEM	DESCRIPTION	QUANTITY	RATE	EXTENSION
	FOR SUBCONTRACTOR SERVICES FOR			
	THE REMOVAL AND DISPOSAL OF			
	IDW NOT TO EXCEED AMOUNT			
	AGREED UPON (SEE TABLE 3			
	ATTACHED) AND WITHIN THE			
	PARAMETERS OF THE AGREEMENT			
	BETWEEN BECHTEL AND WASTE			
	DISPOSAL SUBCONTRACTOR.			

SHADED AREA FOR PROCUREMENT USE ONLY

MOBILIZATION: _____ INTERIM DEMOBILIZATION: _____ INTERIM REMOBILIZATION: _____

COMPLETE ALL WORK: _____ FINAL DEMOBILIZATION: _____ SCHEDULE ATTACHED: ☐ YES ☐ NO

ATTACHMENTS:

- ☐ PROJECT CONTROLS TABLE 3 OF FINAL NEGOTIATED COST PROPOSAL SHOWING SERVICES REQUESTED. (REQUIRED)
- ☐ SITE-SPECIFIC HEALTH & SAFETY PLAN FOR INITIAL FIELD MOBILIZATION (REQUIRED) NOT APPLICABLE
- ☐ OTHER:

COMMENTS:

The IDW described above for removal and disposal was generated during CTO _____ field activities.

For general CTO information, contact CTOL _____

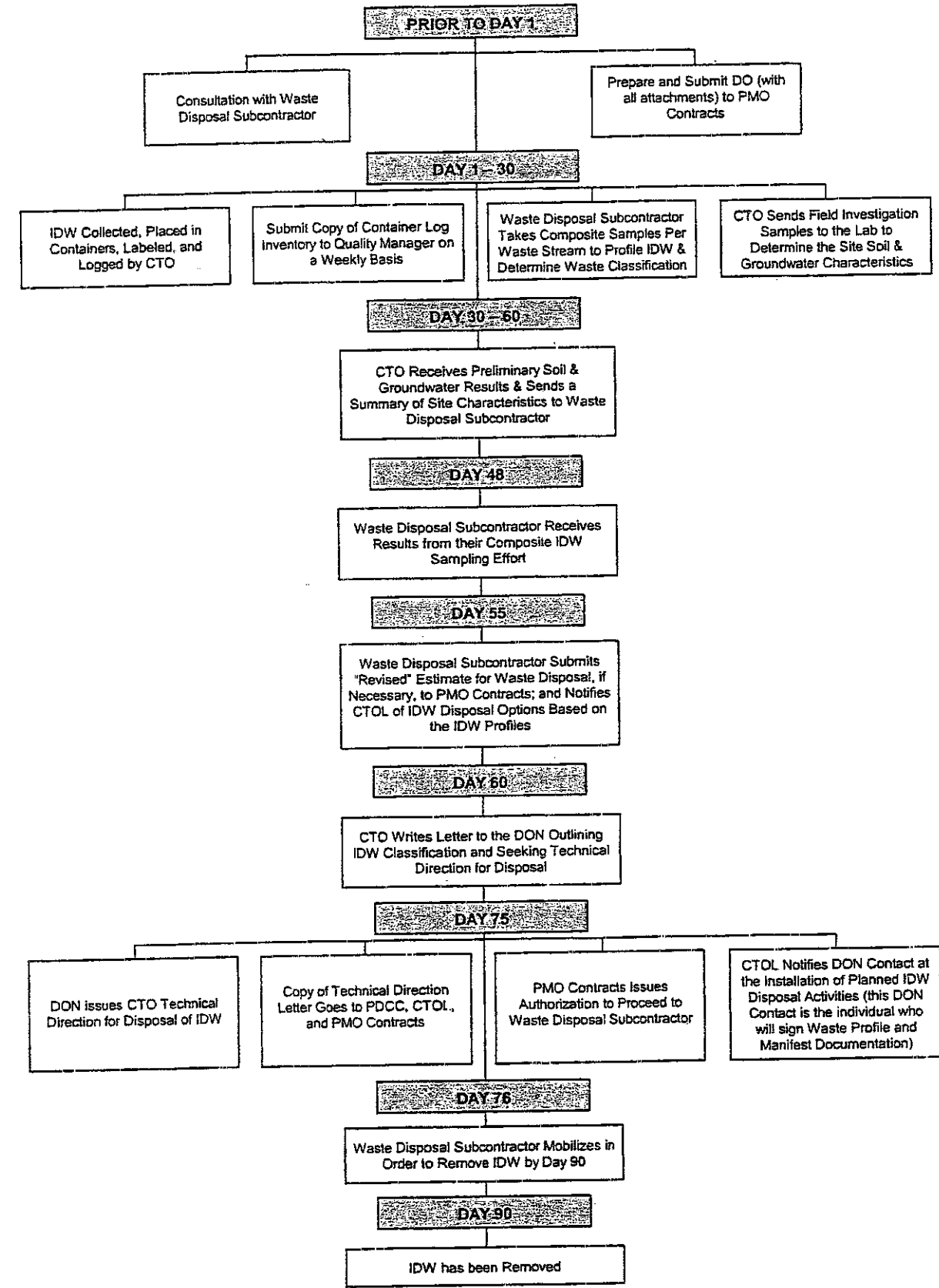
For IDW-specific information, contact IDW Coordinator, _____

APPROVALS

Originator	Phone	CTOL	Health & Safety Manager	Project Manager	Operations Manager
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INVESTIGATION-DERIVED WASTE MANAGEMENT

Navy CLEAN SOP: 22
Rev: 1
Date: 11/07/00
Attachment E Page: 1 of 1



INVESTIGATION-DERIVED WASTE MANAGEMENT

Navy CLEAN SOP: 22
Rev: 1
Date: 11/07/00
Attachment F Page: 1 of 1

The label below is an interim identification label only. Prior to disposal or shipment off-site, the drums will be labeled with the appropriate DOT or U.S. EPA-state identification and classification information by the waste disposal subcontractor.

INVESTIGATION-DERIVED WASTE
SAMPLED – PENDING ANALYSIS

DO NOT HANDLE OR MOVE DRUM, OR REMOVE LID WITHOUT
AUTHORIZATION

The contents of this container have been sampled and are pending analytical results. State and Federal law prohibit improper disposal. Questions regarding this container should be directed to one of the Department of the Navy representatives listed on this label below.

Project: [Navy CLEAN]
Location: [Base Name, city and state]
Installation Point of Contact: [e.g., ROICC, on-site contact]
Site-Specific Location: [Site location and boring/well locations]
Owner: [e.g., U.S. Navy XYZ Base or activity]
CTO No.: [CTO X]
Navy Remedial Project Mgr: [Fred Smith, (XXX) XXX-XXX]
Container No.: [e.g., # 0001]
Contents: [e.g., drill cuttings, wastewater, used PPE]
Date container filled: [Date]

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KEEP OUT

**AUTHORIZED
PERSONNEL
ONLY**

SAMPLE

SAMPLE

NOTICE

THIS AREA IS FOR BNI SUBCONTRACTOR USE ONLY. FOR ACCESS OR TO REPORT CONDITIONS INSIDE THIS AREA, CONTACT:

LONG BEACH NAVAL SHIPYARD

24 Hour Emergency Response

(310) 547-6333

IR Program Manager

(310) 547-7711/7798

BECHTEL NATIONAL, INC. (BNI)

Site Manager

(310) 807-2208

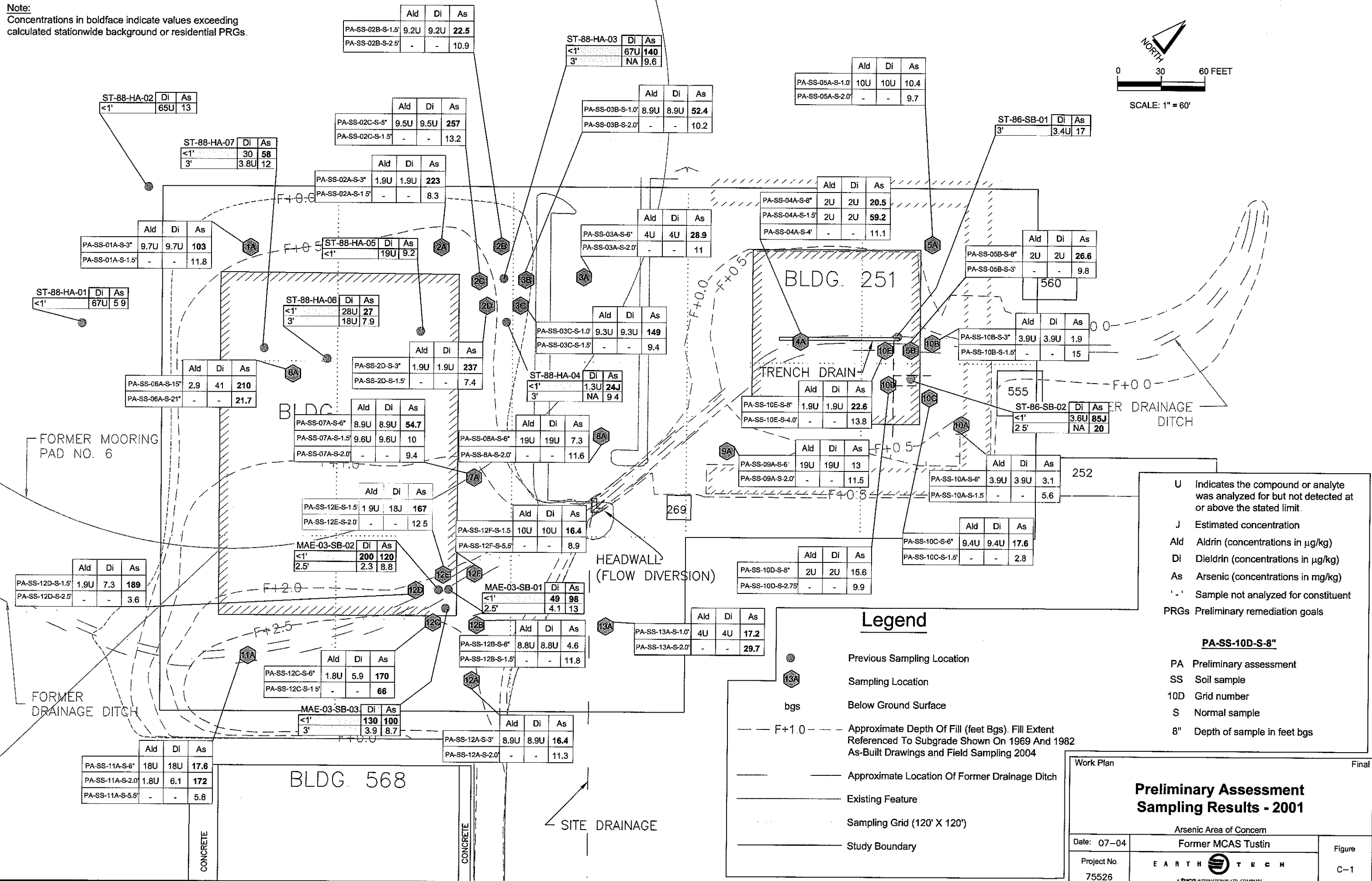
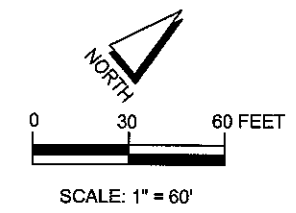
(310) 962-2824 (Mobile)

SAMPLE

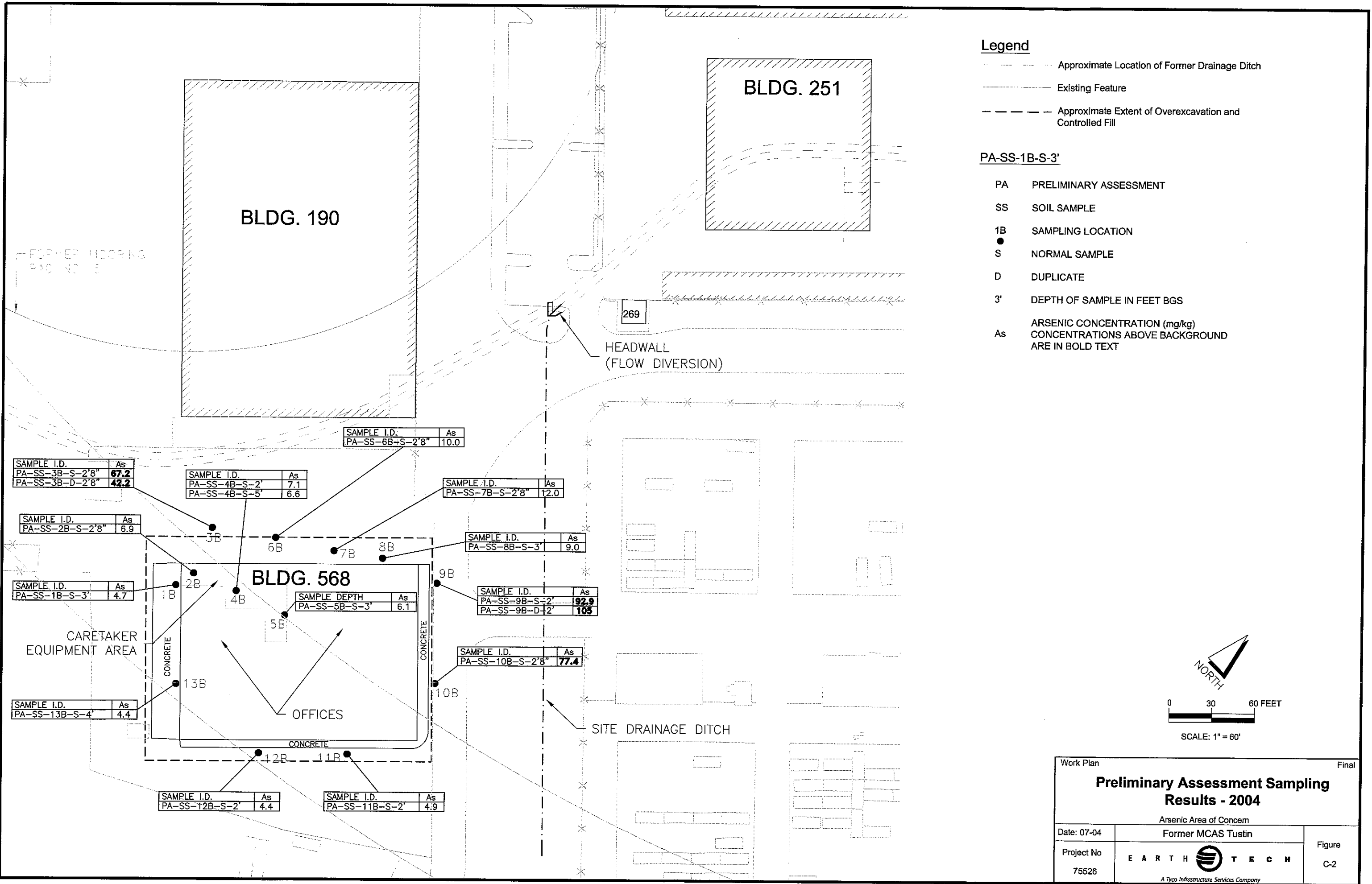
Appendix C

Soil Sampling Results

Note:
Concentrations in boldface indicate values exceeding
calculated stationwide background or residential PRGs.



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Appendix D
Storm Water Management Plan

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ACRONYMS AND ABBREVIATIONS

AOC	area of concern
BMPs	Best Management Practices
Caltrans	State of California Department of Transportation
EPA	Environmental Protection Agency
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NS	non-storm water management
RDW	removal-derived waste
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board
SC	sediment control
SS	soil scheduling
SWMP	storm water management plan
SWRCB	State Water Resources Control Board
TBD	to be determined
TC	tracking control
U.S.	United States
WE	wind erosion
WM	waste management

1. INTRODUCTION AND PROJECT DESCRIPTION

1.1 INTRODUCTION

Construction activities produce many different kinds of pollutants which may cause storm water contamination problems. Pollutants commonly associated with storm water from construction sites include sediment, nutrients, bacteria and viruses, oil and grease, metals, organics, pesticides, gross pollutants (trash, debris, and floatables), and vector production (mosquitoes, flies, and rodents) (California Stormwater Quality Association 2003). In order to control the impact of the pollutants on receiving waters, the United States (U.S.) Environmental Protection Agency (EPA) published final regulations that establish storm water permit application requirements for specified categories of industries on 16 November 1990. The regulations (Phase I) provide that discharges of storm water to waters of the U.S. from construction projects that encompass five acres or more of soil disturbance are effectively prohibited unless the discharge is in compliance with the National Pollutant Discharge Elimination System (NPDES) Permit. The Phase II of the NPDES program that became final on 8 December 1999, expanded the existing NPDES program to address storm water discharges from construction sites that disturb land equal to or greater than one acre and less than five acres. In California, the NPDES storm water permitting program is administered by the State Water Resources Control Board (SWRCB) through its nine Regional Water Quality Control Boards (RWQCBs). The SWRCB has established one statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit), that applies to all storm water discharges associated with construction activity. In order to comply with the General Permit, the owner of construction has to perform following activities:

- Submit a Notice of Intent (NOI) and pay fees prior to the beginning of construction.
- Develop and implement a Storm Water Management Plan (SWMP), which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving offsite into receiving waters.
- Submit a Notice of Termination (NOT) when construction is complete and conditions of termination listed in the NOT have been satisfied.

The implementation of the removal action at the Arsenic Area of Concern (AOC) includes excavation, backfilling, and grading activities that will lead to the disturbance of areas greater than one acre. Therefore, the substantive provisions of the NPDES General Permit for storm water discharges associated with construction activity, including substantive requirements for development and implementation of BMPs, and substantive requirements for the content of a Storm Water Pollution Prevention Plan are to be considered requirements for this alternative. To comply with these substantive requirements:

- A NOI has been completed and attached as Appendix D to the Removal Action Work Plan.
- A SWMP has been prepared to develop and ensure the implementation of BMPs to reduce or eliminate the sediment and other pollutants in storm water as well as non-storm water discharges.
- The BMPs specified in the SWMP will be implemented, inspected and maintained during the implementation of the removal action at the Arsenic AOC to reduce or eliminate storm water pollution and non-storm water discharges.

- A NOT will be completed when the removal action construction is complete and included in the Closure Report that is prepared to document that the response actions have been conducted as specified in the approved work plans.

1.2 OBJECTIVES OF THE SWMP

This SWMP has three main objectives:

- Identify all pollutant sources, including sources of sediment that may affect the quality of storm water discharges associated with construction activity from the construction site,
- Identify non-storm water discharges, and
- Identify, construct, implement in accordance with a time schedule, and maintain BMPs to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the construction site during construction.

1.3 SITE DESCRIPTION

The location and description of the Arsenic AOC is presented in Section 1.1 of the Work Plan.

1.4 PROJECT DESCRIPTION

The removal action at the Arsenic AOC consists of the removal of arsenic-contaminated soil and disposal at an appropriate off-station disposal facility. The removal action design is presented in Section 2 of the Work Plan. The removal action implementation details are provided in Section 3 of the Work Plan. Figure D-1 presents the site map for the Arsenic AOC. The drawing shows the excavation areas, general topography, and drainage patterns in the vicinities of the Arsenic AOC. The construction site estimates relevant to storm water pollution for the Arsenic AOC are provided in Table D-1.

Table D-1: Construction Site Estimates

Description	Arsenic AOC
Total site area	208,379 square feet (4.65 acres) ^a
Estimated area to be disturbed	111,542 square feet (2.56 acres) ^b
Run-off coefficient before construction	0.51
Run-off coefficient after construction	0.27
Anticipated run-on to the site	Negligible
Anticipated run-off from the site	0.90 cubic feet/second

Notes:

^a Area enclosed within temporary fence.

^b Includes area to be excavated and graded.

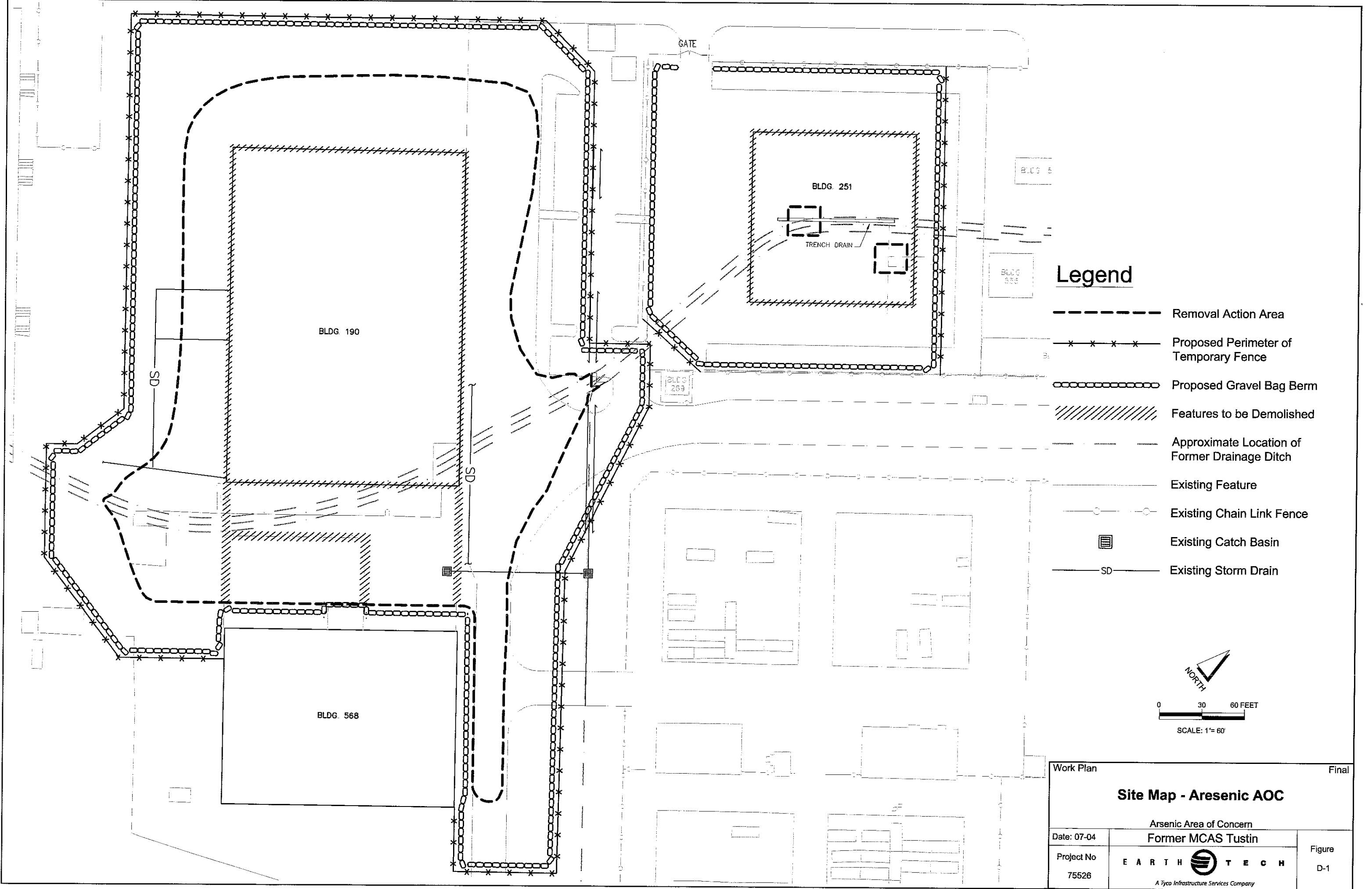
1.5 PROJECT SCHEDULE

The schedule for removal action at the Arsenic AOC that includes sequencing of construction activities with the implementation of BMPs is presented in Table D-2.

Table D-2: Project Schedule

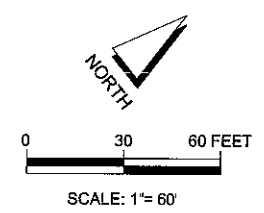
Activity Description	Date
Rainy season ends	05/01/2004
Removal action construction starts	08/02/2004
Site preparation (utility clearance, site security and traffic control measures implementation, decontamination area set up) starts	08/02/2004
Mobilization of equipment and materials begins	08/02/2004
Implementation of sediment control BMPs begins	08/16/2004
Excavation begins	08/23/2004
Implementation of waste management BMPs begins	08/23/2004
Implementation of wind erosion control BMPs begin	08/23/2004
Disposal of excavated soil and implementation of tracking control BMPs begin	08/30/2004
Confirmation sampling begins	10/25/2004
Backfilling and implementation of soil stabilization BMPs begin	11/08/2004
Construction complete	11/22/2004


[illegible]



Legend

- Removal Action Area
- x x x x Proposed Perimeter of Temporary Fence
- o o o o Proposed Gravel Bag Berm
- //// Features to be Demolished
- - - - Approximate Location of Former Drainage Ditch
- _____ Existing Feature
- o o Existing Chain Link Fence
- ⊞ Existing Catch Basin
- SD Existing Storm Drain



Work Plan		Final	
Site Map - Aresenic AOC			
Arsenic Area of Concern			
Date: 07-04		Former MCAS Tustin	
Project No 75526		Figure D-1	
EARTH  TECH <i>A Tyco Infrastructure Services Company</i>			

2. POLLUTANT SOURCE IDENTIFICATION

The following is a list of construction materials that may have the potential to contribute sediments and pollutants to storm water run-off:

- Excavated arsenic-contaminated soil,
- Miscellaneous debris removed during excavation,
- Decontamination water,
- Soil used for backfilling of the excavated areas,
- Class II aggregates used for backfilling,
- Wastes generated during equipment servicing at the site,
- Disposable personnel protective equipment,
- Disposable sampling equipment,
- Sanitation facilities, and
- Miscellaneous trash.

Construction activities that have the potential to contribute sediment to storm water discharges include:

- Contaminated soil excavation,
- Off-site transport of the excavated soil,
- Backfilling, and
- Grading and site restoration operations.

3. STORM WATER POLLUTION CONTROLS

The BMPs were developed for the removal action at the Arsenic AOC based on the site characteristics such as drainage patterns, and the construction activities that have the potential to contribute sediments and pollutants to storm water run-off (see Figure D-1). BMPs for soil scheduling (SS), sediment control (SC), tracking control (TC), wind erosion (WE) control, non-storm water management (NS), and waste management (WM) have been referenced from State of California Department of Transportation (Caltrans) 2003a and will be implemented (as necessary) during construction activities. These BMPs are divided into the following categories:

- Soil Stabilization BMPs (Section 3 of Caltrans 2003a)
- Sediment Control BMPs (Section 4 of Caltrans 2003a)
- Tracking Control BMPs (Section 6 of Caltrans 2003a)
- Wind Erosion Control BMPs (Section 5 of Caltrans 2003a)
- Non-Storm Water Management BMPs (Section 7 of Caltrans 2003a)
- Waste Management BMPs (Section 8 of Caltrans 2003a)

3.1 SOIL STABILIZATION BMPs

The soil stabilization BMPs for the removal action at the Arsenic AOC include scheduling, and backfilling and site restoration.

3.1.1 Scheduling (SS-1)

A project schedule was developed for the removal action implementation at the Arsenic AOC that includes sequencing of construction activities with the implementation of construction site BMPs such as soil stabilization and sediment control measures (see Section 1.5). This schedule will help coordinate the implementation of the BMPs with the implementation of major construction activities at the Arsenic AOC. The primary feature of this BMP is the scheduling of construction work including soil disturbing activities at the Arsenic AOC during the non-rainy season.

3.1.2 Backfilling and Site Restoration

Following confirmation sampling and after regulatory agencies concur on the achievement of the cleanup levels, the excavated areas at the Arsenic AOC will be backfilled and compacted. The fill materials will be characterized before backfilling as described in Section 2.6 of the Work Plan to document that it does not contain contaminants above the EPA established preliminary remediation goals (for organic chemicals) or Marine Corps Air Station Tustin background soil concentrations (for metals). Following compaction of the fill, 6 inches of Class II aggregate base will be provided as described in Section 3.11 of the Work Plan. These aggregates will prevent direct contact of the storm water with the soil and eliminate or reduce erosion.

3.2 SEDIMENT CONTROL BMPs

3.2.1 Gravel Bag Barriers (SC-6)

Sediment control BMPs including gravel bag barriers will be implemented at the Arsenic AOC to prevent or minimize the contamination of storm water with sediment and other pollutants (see Figure D-1). Gravel bags will be installed along the perimeter of the removal action area to act as a barrier to the flow of sediments out of the site.

3.2.2 Storm Drain Inlet Protection (SC-10)

The storm drain inlets in the vicinity of the disturbed areas of the Arsenic AOC (see Figure D-1) will be protected in the event of predicted storm by installing gravel bags around the inlets to allow sediment to settle and/or filter prior to discharge into the storm drains.

3.3 TRACKING CONTROL BMPs (TC-1, TC-2, TC-3)

Tracking control BMPs will be implemented at the Arsenic AOC to prevent or reduce sediment or contaminated soil from being transported to public roadways. During loading of the contaminated soil into trucks for offsite disposal, the trucks will remain on clean areas to minimize the need to decontaminate the truck tires. Prior to leaving the load-out area, the tires and sides of the truck will be inspected for loose soil debris. Any extra soil will be removed using a wire brush or broom.

3.4 WIND EROSION CONTROL BMPs (WE-1)

Wind erosion control BMPs that will be implemented during the removal action implementation at the Arsenic AOC are identified and described in the Section 3.12 (Fugitive Dust Control) of the Work Plan. These methods include watering of the disturbed areas, and limiting the speed of the trucks on the unpaved portions of the sites to less than ten miles per hour.

3.5 NON-STORM WATER MANAGEMENT BMPs**3.5.1 Dewatering Operations (NS-2)**

Should the rainfall occur during the implementation of excavation at the Arsenic AOC, any collected rainwater will be pumped from the excavation and placed in U.S. Department of Transportation-approved 55-gallon drums. These drums will be managed with the decontamination water as specified in the Section 2.1.7 of the Sampling and Analysis Plan (Appendix A).

3.6 WASTE MANAGEMENT BMPs (WM-3 TO WM-10)

During the removal action implementation at the Arsenic AOC, different kinds of wastes (removal-derived wastes [RDW]) will be generated that will need to be disposed. Different kinds of RDW that are anticipated during the removal action implementation at the Arsenic AOC are identified in the Section 2.1.7 of the Sampling and Analysis Plan (Appendix A), along with the procedures for proper handling, management, and disposal.

3.7 TRAINING IN STORM WATER POLLUTION PREVENTION

Training of the field personnel will be conducted to ensure proper implementation and maintenance of the BMPs.

3.8 LIST OF CONTRACTORS/SUBCONTRACTORS RESPONSIBLE FOR SWMP IMPLEMENTATION

The list of contractors and subcontractors responsible for SWMP implementation is provided in Table D-3.

Table D-3: List of Contractors/Subcontractors Responsible for SWMP Implementation

Contractor / Subcontractor Company Name	Responsible Person (Title)	Phone Number	Address	Responsibility
Accord Engineering, Inc	David Cheng (Accord Program Manager)	(714) 730-7688	2472 Chambers, Suite 250, Tustin, CA 92780	Overall responsibility to comply with the substantive requirement of the General Permit and implementation of all the elements of SWMP.
Earth Tech, Inc.	Rodrigo Lazo (Field Manager)	(562) 951-2181	300 Oceangate, Suite 700, Long Beach, CA 90802	Site inspection including inspection of the BMPs in accordance with the requirements of Section 4.1.
TBD (Site Work Contractor)	TBD	TBD	TBD	Conducting excavation and implementing BMPs in accordance with the specifications provided in SWMP.

TBD- to be determined

4. MONITORING PROGRAM AND REPORTING REQUIREMENTS

4.1 SITE INSPECTIONS

The removal action contractor will conduct site inspections including the inspection of all the BMPs as follows:

- Prior to a forecast storm,
- After a rain event that causes runoff from the construction site, and
- At 24-hour intervals during extended rain events.

During these inspections, BMPs will be evaluated for adequacy and proper implementation and whether additional BMPs are required. The results of all inspections and assessments will be documented and the copies of the completed inspection checklists will be maintained with the SWMP. The checklist that will be used for site inspections is shown in Table D-4. The name of the assigned inspector is Rodrigo Lazo and the contact number is (562) 951-2181.

Table D-4: Site Inspection Checklist

General Information				
Project Name	Non-Time-Critical Removal Action at the Arsenic AOC, Marine Corps Air Station Tustin			
Contractor				
Inspector's Name				
Inspector's Title				
Inspector's Signature				
Inspector's Contact Number				
Inspection Date				
Inspection Type	<input type="checkbox"/> Prior to forecast rain <input type="checkbox"/> After a rain event <input type="checkbox"/> 24-hour intervals during extended rain <input type="checkbox"/> Other _____			
Weather Information				
Storm Start Date & Time				
Storm Duration (hours)				
Time Elapsed Since Last Storm				
Approximate Rainfall Amount (inches)				
BMP Inspection				
BMP	Yes	No	N/A	Corrective Action
Sediment Control BMPs				
Is storm water runoff from off-site areas flowing through the excavated areas?				
Are the gravel bags properly installed and adequately serving their purpose? Provide the results of inspections at various locations separately in the space provided below.				

BMP Inspection				
BMP	Yes	No	N/A	Corrective Action
Location:				
Location:				
Location:				
Location				
Location:				
Location:				
Is the sediment built-up less than 1/3 the height of the gravel bags? Provide the results of inspections at various locations separately in the space provided below.				
Location:				
Location:				
Location:				
Location				
Location:				
Location:				
Are the gravel bag barriers installed around the storm drains adequately serving their purpose? Provide the results of inspections at various locations separately in the space provided below.				
Location:				
Location:				
Location:				
Wind Erosion Control BMPs				
Are the dust control measures adequately serving their purpose? Provide the results of inspections at various locations separately in the space provided below.				
Location:				

BMP Inspection				
Non-Storm Water Control BMPs				
Is dewatering of the excavation areas required? Provide the results of inspections at various locations separately in the space provided below.				
Location:				
Location:				
If dewatering is conducted, was the pumped water stored in U.S. DOT-approved 55-gallon drums?				
Waste Management BMPs				
Are the drums in the decontamination area properly covered and structurally sound?				

4.2 NONCOMPLIANCE REPORTING

If a discharge occurs or if the project receives a written notice of non-compliance, the removal action contractor will immediately notify the U.S. Navy Remedial Project Manager (RPM) and RWQCB by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. A written report will be filed to the RPM within 7 days, and to the RWQCB within 14 calender days of the identification of non-compliance. The report to the RPM and RWQCB will contain the following items:

- The date, time, location, nature of operation, and type of unauthorized discharge, including the cause or nature of the notice or order.
- The BMPs currently being implemented.
- Any additional BMPs which will be implemented to prevent or reduce pollutants that are causing or contributing to the exceedance of water quality standards.
- An implementation and maintenance schedule for any affected BMPs.

This report shall include an implementation schedule for corrective actions and shall describe the actions taken to reduce the pollutants causing or contributing to the exceedance.

4.3 MONITORING PROGRAM FOR POLLUTANTS IN STORM WATER

The construction project at the Arsenic AOC does not lead to discharges of storm water directly into the water body listed as impaired due to sedimentation/siltation and/or turbidity pursuant to Section 303(d) of the Clean Water Act. Therefore, no sampling and analysis is planned for assessment of sediment in the storm water associated with construction activity at the Arsenic AOC.

The soil at the Arsenic AOC is known to be contaminated with arsenic. Arsenic is present at relatively low concentrations at site, adsorbs readily to the soil and is relatively immobile in the environment. There is limited potential for arsenic to partition from soil into storm water.

Additionally, BMPs have been implemented to prevent or reduce the offsite migration of the sediment. Therefore, no sampling of the storm water will be conducted during construction activity at the Arsenic AOC

5. REFERENCES

California Stormwater Quality Association (CASQA). 2003. *California Stormwater Quality Association Best Management Practice Handbook Construction*. Livermore, California. January.

United States Environmental Protection Agency (EPA). 1992. *Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices*. Office of Water. EPA 832-R-92-005.

State of California Department of Transportation (Caltrans). 2003a. *Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual*. March.

———. 2003b. *Storm Water Quality Handbooks, Storm Water Pollution Prevent Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual*. March.

Attachment 1
Runoff/Runon Computation

1. The first part of the document is a list of names and their corresponding dates. The names are listed in a column on the left, and the dates are listed in a column on the right. The names are: John Doe, Jane Smith, and Bob Johnson. The dates are: 1/1/2020, 2/1/2020, and 3/1/2020.

Computation Sheet for Estimating Runoff

Arsenic AOC

Total area enclosed within the temporary fence	208,379 square feet	(A)
Existing Site Conditions		
Asphalt/Concrete paved (Impervious) area	111,542 square feet	(B)
Asphalt/Concrete paved (Impervious) runoff coefficient	0.95	(C)
Effective runoff coefficient for the entire site	0.51	(D) = (B*C)/(A)
10-year, 6 hour storm	2.2 inches*	(E)
Area rainfall intensity	9.3 mm/hour	(F) = ((E*25.4)/6)
Estimated run-off from the site	0.90 cfs	(G) = (9.11E-07*A*D*F)

Proposed Site Conditions

Class II aggregate area and Unpaved area	111,542 square feet	(B)
Class II aggregate area and Unpaved area runoff coefficient	0.50	(C)
Effective runoff coefficient for the entire site	0.27	(D) = (B*C)/(A)
10-year, 6 hour storm	2.2 inches*	(E)
Area rainfall intensity	9.3 mm/hour	(F) = ((E*25.4)/6)
Estimated run-off from the site	0.47 cfs	(G) = (9.11E-07*A*D*F)

Note: * Source: Western U.S. Precipitation Frequency Maps (<http://www.wrcc.dri.edu/pcpnfreq.html>)

Computation Sheet for Estimating Runon

Arsenic Area of Concern
Assumed to be negligible

Attachment 2
Notice of Intent

1. The first part of the document is a list of names and their corresponding dates of birth. The names are listed in a single column, and the dates are listed in a single column to the right of the names. The names are: John Doe, Jane Doe, and John Doe. The dates are: 1912, 1913, and 1914.



State Water Resources Control Board
NOTICE OF INTENT
TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER No. 99-08-DWQ)



I. NOI STATUS (SEE INSTRUCTIONS)

MARK ONLY ONE ITEM	1. <input checked="" type="checkbox"/> New Construction	2. <input type="checkbox"/> Change of Information for WDID#	
--------------------	---	---	--

II. PROPERTY OWNER

Name Department of the Navy, Southwest Division Naval Facilities Engineering Command	Contact Person DeAnna Dunbar		
Mailing Address 1230 Columbia Street, Suite 870	Title Remedial Project Manager		
City San Diego	State CA	Zip 92101-8517	Phone (619) 532-0794

III. DEVELOPER/CONTRACTOR INFORMATION

Developer/Contractor Accord Engineering, Inc.	Contact Person David Cheng		
Mailing Address 1231 Dyer Road, Suite 265	Title Project Manager		
City Santa Ana	State CA	Zip 92705	Phone (714) 730 - 7688

V. CONSTRUCTION PROJECT INFORMATION

Site/Project Name Non-Time Critical Removal Action, Arsenic Area of Concern		Site Contact Person Rodrigo Lazo	
Physical Address/Location Former Marine Corps Air Station Tustin	Latitude 33°41'0.12"N	Longitude 117°48'45.9"W	County United States of America
City (or nearest City) Tustin	Zip 92618	Site Phone Number (562) 254-9232	Emergency Phone Number (562) 254-9232
A Total size of construction site area: 4.78 Acres	C Percent of site imperviousness (including rooftops): Before Construction: 100 % After Construction: 0 %		D Tract Number(s): _____ E Mile Post Marker: _____
B Total area to be disturbed: 2.56 Acres (% of total 53.6 %)			
F Is the construction site part of a larger common plan of development or sale? <input type="checkbox"/> NO <input type="checkbox"/> YES		G Name of plan or development: N/A	
H Construction commencement date: 08/02/2004		J Projected construction dates: Complete grading: 11/22/2004 Complete project: 11/22/2004	
I % of site to be mass graded: 53.6 %			
K Type of Construction (Check all that apply): 1 <input type="checkbox"/> Residential 2 <input type="checkbox"/> Commercial 3 <input type="checkbox"/> Industrial 4 <input type="checkbox"/> Reconstruction 5 <input type="checkbox"/> Transportation 6 <input type="checkbox"/> Utility Description: _____ 7 <input checked="" type="checkbox"/> Other (Please List): Excavation and off-station disposal of contaminated soil			

V. BILLING INFORMATION

<input type="checkbox"/> SEND BILL TO: OWNER (as in II. above)	Name	Contact Person	
<input checked="" type="checkbox"/> DEVELOPER (as in III. above)	Mailing Address	Phone/Fax	
<input type="checkbox"/> OTHER (enter information at right)	City	State	Zip

VI. REGULATORY STATUS

A. Has a local agency approved a required erosion/sediment control plan?

☐ YES ☒ NO

Does the erosion/sediment control plan address construction activities such as infrastructure and structures?

☐ YES ☒ NO

Name of local agency: Phone:

B. Is this project or any part thereof subject to conditions imposed under a CWA Section 404 permit of 401 Water Quality Certification?

☐ YES ☒ NO

If yes, provide details:

VII. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. ☒ Indirectly to waters of the U.S.

2. ☒ Storm drain system - Enter owner's name: Department of the Navy, Southwest Division Naval Facilities Engineering Command

3. ☐ Directly to waters of U.S. (e.g. , river, lake, creek, stream, bay, ocean, etc.)

B. Name of receiving water: (river, lake creek, stream bay, ocean):

VIII. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (check one)

☒ A SWPPP has been prepared for this facility and is available for review: Date Prepared: 03/23/2004 Date Amended:

☐ A SWPPP will be prepared and ready for review by (enter date):

☐ A tentative schedule has been included in the SWPPP for activities such as grading, street construction, home construction, etc.

B. MONITORING PROGRAM

☒ A monitoring and maintenance schedule has been developed that includes inspection of the construction BMPs before anticipated storm events and after actual storm events and is available for review

If checked above: A qualified person has been assigned responsibility for pre-storm and post-storm BMP inspections to identify effectiveness and necessary repairs or design changes ☒ YES ☐ NO

Name: Rodrigo Lazo Phone: (562) 254 - 9232

C PERMIT COMPLIANCE RESPONSIBILITY

A qualified person has been assigned responsibility to ensure full compliance with the Permit, and to implement all elements of the Storm Water Pollution Prevention Plan including:

1. Preparing an annual compliance evaluation ☒ YES ☐ NO

Name: David Cheng Phone: (714) 730 - 7688

2. Eliminating all unauthorized discharges. ☒ YES ☐ NO

IX. VICINITY MAP AND FEE (must show site location in relation to nearest named streets, intersections, etc.)

Have you included a vicinity map with this submittal?

☒ YES ☐ NO

Have you included payment of the annual fee with this submittal?

☐ YES ☒ NO

X. CERTIFICATIONS

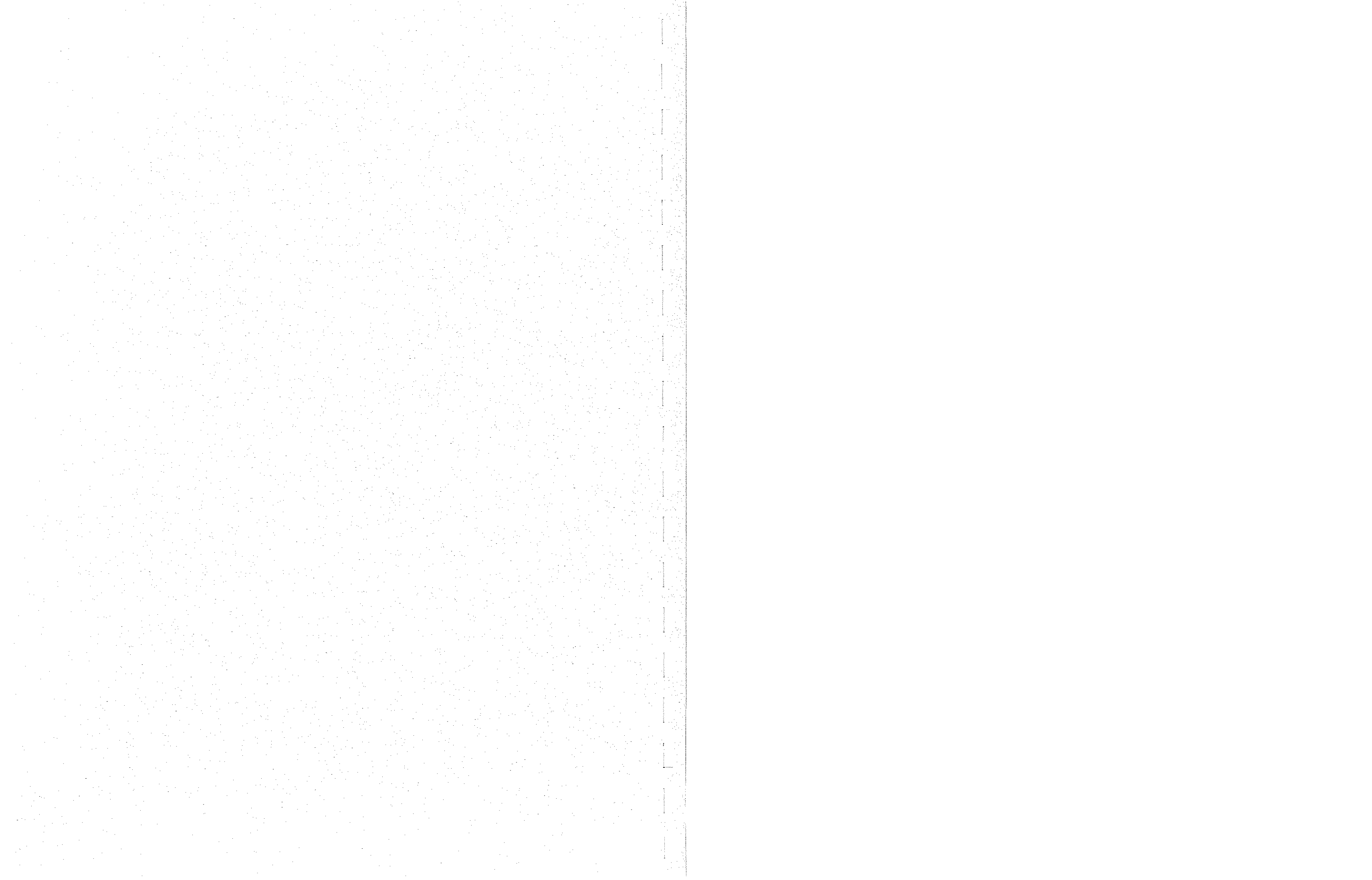
"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."

Printed Name: DeAnna Dunbar

Signature: Date:

Title:

Appendix F
Forms and Submittal Register



JHTM & ASSOCIATES

CARETAKER MANAGER, FORMER MCAS TUSTIN

UTILITY CLEARANCE REQUEST (DIG PERMIT) PROCEDURES

I. Applicability:

The requirement for submitting a Utility Clearance Request shall apply to all contractors, including those reporting to the Navy and/or the City of Tustin; subcontractors; tenants and licensees who intend to conduct any subsurface excavation, digging, drilling or other disturbance of the ground surface, either natural soil or paved, at the Former MCAS Tustin.

II. Utility Clearance Request Form Submittal Process:

- A. Prior to the start of subsurface work, all parties listed above must obtain final approval from the City of Tustin submitting a Utility Clearance Request Form (attached) to JHTM & Associates, the City's designated Caretaker Manager.
- B. Utility Clearance Requests must be properly filled out sent to the Caretaker Manager Service Desk (JHTM & Associates) five working days prior to the intended start of excavation. Filled out Utility Clearance Requests can be submitted to the Caretaker Manager Service Desk at the following:
 - Fax: (714) 540-4625
 - Email: phimes@jhtm.com
- C. Requests from Navy subtenants, licensees, and contractors must be approved by the Navy prior to submittal to the Caretaker Manager Service Desk.
- D. The Caretaker Manager will review submitted requests and provide necessary coordination, to include identifying conflicts with existing utilities.
- E. Following review, the Caretaker Manager will forward a recommendation to the City of Tustin.
- F. When approved by the City of Tustin, the Caretaker Manager will return the signed Utility Clearance Request form to the requesting Party.

III. Questions: Please Call the Caretaker Manager Service Desk at (714) 540-7350.

JHTM & ASSOCIATES

CARETAKER MANAGER, FORMER MCAS TUSTIN

UTILITY CLEARANCE REQUEST (DIG PERMIT) FORM

FORMER MCAS TUSTIN, CA		WORK ORDER NUMBER:	
1. Facility/Location:	A. Excavation <input type="checkbox"/>	C. Drainage Ditches <input type="checkbox"/>	
	B. Pavements <input type="checkbox"/>	D. Other (specify) <input type="checkbox"/>	
2. Method of Excavation:	A. Hand <input type="checkbox"/>	C. Ditcher <input type="checkbox"/>	
	B. Power Equipment <input type="checkbox"/>	D. Other (specify) <input type="checkbox"/>	
3. Detailed description of Scope of Work (duration of work, depth, width, length, location, and indicate whether work will require road closure, discontinuance of utility service or other disturbance. Provide sketches as applicable)			
<i>(If any line is damaged during the excavation process, notify the Caretaker Manager Service Desk at 714-540-7350)</i>			
4. Date clearance required:		5. Date submitted:	
6. Applicant (Print):	6a. Phone Number:	7. Applicant Signature:	

JHTM & ASSOCIATES

CARETAKER MANAGER, FORMER MCAS TUSTIN

UTILITY CLEARANCE REQUEST (DIG PERMIT) FORM

A. Electrical Distribution	
B. Natural Gas Distribution	
C. Sanitary Sewer Distribution	
D. Industrial Waste Distribution	
E. Water Distribution	
F. Other	
Navy Recommendation [949-726-2506] (if applicable):	
Concur <input type="checkbox"/>	Do Not Concur <input type="checkbox"/>
NAVFAC SouthWestDiv Rep. Signature	Date:
Caretaker Manager Recommendation	
Concur <input type="checkbox"/>	Do Not Concur <input type="checkbox"/>
Caretaker Manager Signature	Date:
City of Tustin: Mr. Dana Ogdon	
Approved <input type="checkbox"/>	Disapproved <input type="checkbox"/>
City Signature	Date:

Submittal Register – Removal Action, Arsenic Area of Concern, MCAS Tustin

Description Item Submitted	Contractor: Schedule Dates		Reviewing Authority			
	Date Submitted	Concurrence Needed By	Date Forwarded to Reviewing Authority/ Date Received from Contractor	Date Forwarded to Other Reviewer	Date Received from Other Reviewer	Date Mailed to Contractor/ Date Received from Reviewing Authority
Site-Specific Health and Safety Plan						Remarks
Traffic Control Plan						
Field Change Requests						
Field Change Notices						
Nonconformance Reports						
Progress Reports						
QC Certificates						
Waste Shipping Documents						
Backfill Testing						
Closure Report						
Confirmation Sampling and Analysis						
Record (as-built) Drawings						

Appendix G

CQC Checklists

DEFINABLE FEATURES OF WORK - REMOVAL ACTION AT THE ARSENIC AOC

- Utility Clearance
- Site Preparation
- Demolition/Excavation
- Off-site Transportation of Excavated Soil
- Backfilling and Site Restoration

The checklists for each of the above-mentioned definable features of work for removal action at the Arsenic Area of Concern (AOC) are presented in the following tables.

PREPARATORY PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Utility Clearance

#	Item	Comments
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Submittals Review and Approval

1.	Is the Removal Action Work Plan approved? If not, identify the items that have not been approved.	Yes	No
2.	Is the Health and Safety Plan for removal action approved? If not, identify the items that have not been approved.	Yes	No

Materials/Services Procurement

3.	Are all the records including site plans, utility layouts, and as-built drawings available? If not, list the missing items and actions taken to obtain them?	Yes	No
4.	Is the Geophysical subcontractor selected?	Yes	No

Project Planning Documents/Field Procedures Review

5.	Has the Removal Action Work Plan been reviewed by the geophysical subcontractor?	Yes	No
6.	Are there any variances from the geophysical survey procedures specified in the Removal Action Work Plan and project Scope of Work? If yes, list the variances.	Yes	No
7.	Are the variances acceptable? If not, explain how unacceptable variances were resolved.	Yes	No

Other Preparatory Work

8.	Are the boundaries of the excavation area clearly marked for conducting geophysical surveys?	Yes	No
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#	Item	Comments	
8.	Does a review of record drawings show the location of utilities within the boundary of the excavation area? List identified utilities.	Yes	No
9.	Has the City of Tustin been notified of the physical site inspection for verification of the location of utility lines?	Yes	No
Health and Safety			
10.	Is the Health and Safety Plan transmitted to the geophysical subcontractor?	Yes	No

INITIAL PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Utility Clearance

#	Item	Comments
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Equipment Checks

1.	Has the subcontractor performed calibration check on the instruments used for geophysical survey?	Yes No
2.	List issues (if any) with instruments and field methods, which needed to be resolved.	

Preliminary Work

3.	Have the utility locations identified based on the records review tentatively been identified at the site prior to geophysical survey?	Yes No
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Health and Safety

4.	Have the site personnel participated in the site-specific health and safety orientation?	Yes No
5.	Is adequate personnel protective equipment identified for utility clearance in the site-specific health and safety plan available? List missing items and actions taken to obtain them	Yes No

FOLLOW-UP PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Utility Clearance

#	Item	Yes	No	Comments
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Field Quality Control

1.	Have the utility lines been clearly marked at the site based on the review of record drawings and geophysical surveys?	Yes	No	
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Inspections/Tests

2.	Has the City of Tustin conducted a physical site inspection to verify the locations of the utility lines? List date of inspection and any comments received from City of Tustin and how they were resolved?	Yes	No	
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Submittals

3.	Is the utility clearance request form completed and submitted to the City of Tustin 14 days prior to the planned start of the excavation? Provide date of submittal of the utility clearance request form?	Yes	No	
4.	Has the City of Tustin approved utility clearance request form? Provide date of approval.	Yes	No	

Health and Safety

5.	List any safety violations and corrective actions taken			
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PREPARATORY PHASE CHECKLIST	
Contract Number	N68711-04 C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Site Preparation

#	Item	Comments
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Submittal Review and Approval

1.	Is the Removal Action Work Plan approved? If not, identify the items that have not been approved.	Yes	No
2.	Is the Health and Safety Plan for removal action approved? If not, identify the items that have not been approved.	Yes	No

Materials/Services Procurement

3.	Is the Site Work subcontractor identified?	Yes	No
4.	Have the traffic control supplies been procured?	Yes	No
5.	Have the decontamination area supplies been procured?	Yes	No
6.	Have the BMP supplies (gravel bags) been procured?	Yes	No

Project Planning Documents/Field Procedures Review

7.	Has the Removal Action Work Plan been reviewed by the subcontractors?	Yes	No
8.	Have the site security, traffic control, decontamination, and storm water management procedures been discussed?	Yes	No
9.	Are there any variances from the procedures specified in the Removal Action Work Plan and project Scope of Work? If yes, list the variances.	Yes	No
10.	Are the variances acceptable? If not, explain how unacceptable variances were resolved.	Yes	No

Health and Safety

11.	Is the Health and Safety Plan transmitted to the Site Work subcontractor?	Yes	No
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INITIAL PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Site Preparation

#	Item	Comments
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Materials/Equipment Checks

1	Do the site security materials conform to specifications provided in the Removal Action Work Plan and project Scope of Work? List deficiencies and corrective actions undertaken.	Yes	No
2	Do the traffic control materials conform to specifications provided in the Removal Action Work Plan, Health and Safety Plan and project Scope of Work? List deficiencies and corrective actions undertaken.	Yes	No
3	Do the storm water pollution control materials conform to specifications provided in the Removal Action Work Plan and project Scope of Work? List deficiencies and corrective actions undertaken.	Yes	No
4	Do the staging pile materials conform to specifications provided in Removal Action Work Plan and project Scope of Work? List deficiencies and corrective actions undertaken.	Yes	No
5	Are the roll-off bins structurally sound? List deficiencies and corrective actions undertaken.	Yes	No

Preliminary Work

6	Are the locations for installation of traffic control signage clearly marked?	Yes	No
7	Is the location of decontamination area for excavated soil clearly marked?	Yes	No
8	Is the provision of the backflow preventor and meter necessary for fire hydrants identified within the excavation footprint? Explain.	Yes	No

#	Item	Comments	
Health and Safety			
9	Have the site personnel participated in the site-specific health and safety orientation?	Yes	No
10	Is adequate personnel protective equipment identified for site preparation in the site-specific health and safety plan available? List missing items and actions taken to obtain them.	Yes	No

FOLLOW-UP PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Site Preparation

#	Item	Comments
Inspections		
1.	Inspect decontamination area, and site security and traffic control measures for conformance with Removal Action Work Plan and project Scope of Work. List any deficiencies/variances encountered and corrective actions undertaken	
2.	Inspect best management practices (BMPs) for conformance with Removal Action Work Plan and project Scope of Work. List any deficiencies/variances encountered and corrective actions undertaken.	
Health and Safety		
3.	List any safety violations and corrective actions taken.	

PREPARATORY PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Demolition/Excavation

#	Item	Comments
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Submittals Review and Approval

1.	Is the Removal Action Work Plan approved? If not, identify the items that have not been approved.	Yes	No
2	Is the Health and Safety Plan for removal action approved? If not, identify the items that have not been approved.	Yes	No

Materials/Services Procurement

3.	Have the concrete/asphalt recycling facilities been identified?	Yes	No
4.	Is there water available onsite for fugitive dust control? If not, what corrective actions are taken?	Yes	No
5.	Is the demolition/excavation equipment mobilized to the site? If not list missing items and actions taken to obtain them.	Yes	No

Equipment Storage

6	Is the equipment storage area established?	Yes	No
7.	Is all the equipment stored properly in a designated storage area? If not, what corrective actions are taken?	Yes	No

Project Planning Documents/Field Procedures Review

8.	Is the Removal Action Work Plan transmitted to the Site Work subcontractor?	Yes	No
9.	Are the demolition/excavation procedures discussed?	Yes	No

#	Item	Comments	
10	Are there any variances from the demolition/excavation procedures specified in the Removal Action Work Plan and project Scope of Work? If yes, list the variances	Yes	No
11	Are the variances acceptable? If not, explain how unacceptable variances were resolved.	Yes	No
Other Preparatory Work			
12	Are the boundaries of excavation areas clearly marked with stakes or paint to facilitate implementation of excavation? If not, explain	Yes	No
13	Was any hand digging required to confirm the depths of certain utilities? If yes, list the utility along with its depth.	Yes	No
14	Are all the utilities within the excavation area terminated/abandoned? If not, explain.	Yes	No
Health and Safety			
15	Is the Health and Safety Plan transmitted to the Site Work subcontractor?	Yes	No

INITIAL PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Demolition/Excavation

#	Item	Comments
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Materials/Equipment Checks

1.	Is the excavation/demolition equipment of adequate capability and capacity to perform designated task? If not, what action is taken?	Yes No
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Health and Safety

2.	Have the site personnel participated in the site-specific health and safety orientation?	Yes No
3.	Is the demolition/excavation equipment inspected for fuel leaks, and satisfactory operation of safety features? List deficiencies and corrective actions undertaken.	Yes No
4.	Is adequate personnel protective equipment identified for demolition and excavation in the site-specific health and safety plan available? List missing items and actions taken to obtain them.	Yes No

FOLLOW-UP PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Demolition/Excavation

#	Item	Yes	No	Comments
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Field Quality Control

1	Is the demolished asphalt and concrete broken so that no piece exceeds 12 inches in any dimension? If not, explain.	Yes	No	
2	Is the amount of soil that adheres to concrete/asphalt minimized?	Yes	No	
3	Are the number of loads of demolished concrete/asphalt documented? List the number of loads.	Yes	No	

Inspections/Tests

4	Monitor excavation depth and conduct confirmation sampling once the excavation limits shown in the excavation plans are attained.			
5	Are the fugitive dust control measures implemented? List the measures.	Yes	No	
6	Are the BMPs for storm water pollution control monitored in accordance with the storm water management plan? List any deficiencies and corrective actions undertaken.	Yes	No	
7	Are the traffic control measures functioning satisfactorily? List any deficiencies and corrective actions undertaken.	Yes	No	

#	Item	Comments	
8	Is the site free from trash, and unnecessary debris at the end of each workday?	Yes	No
Health and Safety			
9	Are all safety equipment including eyewash unit, fire extinguisher, and safety devices on demolition/excavation equipment operating satisfactorily? List any deficiencies and corrective actions undertaken.	Yes	No
10.	List any safety violations and corrective actions taken.		

PREPARATORY PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Off-site Transportation of Excavated Soil

#	Item	Comments
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Submittals Review and Approval

1.	Is the Removal Action Work Plan approved? If not, identify the items that have not been approved.	Yes	No
2.	Is the Health and Safety Plan for removal action approved? If not, identify the items that have not been approved.	Yes	No

Materials/Services Procurement

3.	Is the trucking contractor with all the necessary licenses and permits specified in the Removal Action Work Plan, identified? If not, explain.	Yes	No
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Project Planning Documents/Field Procedures Review

4.	Has the transportation subcontractor reviewed the Removal Action Work Plan?	Yes	No
5.	Are the off-site transportation procedures for excavated soil discussed?	Yes	No
6.	Are there any variances from the procedures specified in the Removal Action Work Plan and project Scope of Work? If yes, list the variances.	Yes	No
7.	Are the variances acceptable? If not, explain how unacceptable variances were resolved.	Yes	No

Other Preparatory Work

8.	Is the waste profile completed and submitted to disposal facilities for acceptance?	Yes	No
9.	Is the disposal facility selected? List the name of the selected disposal facility.	Yes	No

#	Item	Comments	
10.	Is the staging area for trucks established?	Yes	No
11.	Is the truck route to the disposal facility established?	Yes	No
12.	Is the area for decontamination of truck tires established?	Yes	No
Health and Safety			
13.	Is the Health and Safety Plan transmitted to the Site Work subcontractor?	Yes	No

INITIAL PHASE CHECKLIST			
Contract Number	N68711-04-C-1006		
Project Name			
Site ID			
Date			
Definable Feature of Work	Off-site Transportation of Excavated Soil		
#	Item	Comments	
Preliminary Work			
1.	Is the waste manifest (if the waste is hazardous) or bill of lading (if the waste is non-hazardous) completed?	Yes	No
2.	Is the load inspection report completed?	Yes	No
Health and Safety			
3.	Are the safety features of the trucks operating satisfactorily? List deficiencies and corrective actions undertaken	Yes	No
4.	Do the truck operators have adequate personnel protective equipment in accordance with their organization's safety policies and procedures? List missing items and actions taken to obtain them	Yes	No

FOLLOW-UP PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Off-site Transportation of Excavated Soil

#	Item	Comments	
Field Quality Control			
1	Is every loaded truck weighed using axle gauges before it leaves the site? If not, explain.	Yes	No
2	Is each loaded truck covered with tarps?	Yes	No
3	Prior to leaving the site, is any loose soil debris from the tires and sides of the truck removed? If not, explain.	Yes	No
4	Is the actual weight of soil determined using certified scales at the disposal facility? If not, explain.	Yes	No
5	Is the load inspection report completed? If not, explain.	Yes	No
6	Are the manifests and destruction certificates forwarded to the DON within mandated reporting period? If not, explain.	Yes	No
Health and Safety			
7	Are the trucks following the traffic control plan and established truck route? If not, explain.	Yes	No

#	Item	Comments
8.	List any safety violations and corrective actions taken	

PREPARATORY PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Backfilling and Site Restoration

#	Item	Comments	
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Submittals Review and Approval

1.	Is the Removal Action Work Plan approved? If not, identify the items that have not been approved.	Yes	No
2.	Is the Health and Safety Plan for removal action approved? If not, identify the items that have not been approved.	Yes	No

Materials/Services Procurement

3.	Is the geotechnical subcontractor identified?	Yes	No
4.	Is the geotechnical laboratory for testing backfill material using ASTM Method D1557-02, identified?	Yes	No
6.	Are the samples collected from the borrow source subjected to chemical and geotechnical analyses in accordance with the procedures presented in the Removal Action Work Plan?	Yes	No
7.	Do the results of chemical analyses on the backfill samples show that backfill source is acceptable (in accordance with the criteria presented in the Removal Action Work Plan)? If not, list the actions taken.	Yes	No
8.	Do the results of laboratory test conducted in accordance with ASTM Method D1557-02 show that backfill source is acceptable? If not, list the actions taken.	Yes	No
9.	Is the source for Class II aggregate base identified? If not, explain.	Yes	No

Project Planning Documents/Field Procedures Review

10.	Is the Removal Action Work Plan transmitted to the geotechnical subcontractor?	Yes	No
11.	Are the procedures for backfilling discussed with the site work subcontractor?	Yes	No

#	Item	Comments	
12.	Are the procedures for geotechnical testing discussed with the geotechnical subcontractor?	Yes	No
13	Are there any variances from the backfilling procedures specified in the Removal Action Work Plan and project Scopes of Work? If yes, list the variances.	Yes	No
14.	Are the variances acceptable? If not, explain how unacceptable variances were resolved.	Yes	No
Health and Safety			
15	Is the Health and Safety Plan transmitted to the geotechnical subcontractor?	Yes	No

INITIAL PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Backfilling and Site Restoration

#	Item	Comments
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Materials/Equipment Checks

1.	Has the subcontractor performed calibration check on instruments used for field density tests?	Yes No
2.	List any issues that needed to be resolved.	
3.	Is the compaction equipment of adequate capability and capacity to perform the designated task? If not, what action is taken?	Yes No

Preliminary Work

4.	Is it verified through visual observation that a firm base exists at the bottom of the excavation. If not, explain.	Yes No
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Health and Safety

5.	Have the site personnel participated in the site-specific health and safety orientation?	Yes No
6.	Is adequate personnel protective equipment identified in the site-specific health and safety plan for backfilling and site restoration, and field density tests using nuclear density gauges, available? List missing items and action taken to obtain them.	Yes No

FOLLOW-UP PHASE CHECKLIST	
Contract Number	N68711-04-C-1006
Project Name	
Site ID	
Date	
Definable Feature of Work	Backfilling and Site Restoration

#	Item	Comments
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Field Quality Control

1.	Is the moisture content of the fill material within 3 percent of the optimum moisture content? If not, what measures are taken to achieve optimum moisture content?	Yes	No
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Inspections/Tests

2.	Perform field density tests at the frequencies provided in the removal action work plan. State the methods used and number of tests performed.		
3.	Do the results of the field density tests show that the fill is compacted to 90 percent of the maximum dry density?	Yes	No
4.	Do the results of the field density tests show that the aggregate are compacted to 90 percent of the maximum dry density?	Yes	No

Health and Safety

5.	List any safety violations and corrective actions taken		
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Appendix H
Response to Comments

Document Title:

(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.

Reviewer: Anantaramam (Ram) Peddada, Remedial Project Manager, Base Closure and Reuse Unit, Office of Military Facilities, Department of Toxic Substances Control; comments dated June 25, 2004.

Comment No.	Section/ Page No.	Comment	Response
6.	Appendix A Section 1.1.5 Development of a Decision Rule	Note Decision Rule 2: It contradicts the removal action objectives for Buildings 190 and 251. DTSC disagrees with Decision Rules 2, 3, and 4, as shown on page A-2. Specifically, DTSC agreed to clean-up standards for arsenic of 17.5 and 35 mg/kg at Buildings 190 and 251, respectively, based on ambient conditions of arsenic in soil at MCAS Tustin. These clean-up standards are now to be applied as "not-to exceed" or performance standards. Therefore, if any confirmation sample exceeds these values, additional removal would be required. Because these performance standards are absolute, the "Tolerable Limits on Decision Error" described in Section 1.1.6 on pages A-2 and A-3 are not applicable. Section 1-1-7 sampling design has to be revised according to DTSC comment.	<p>Since the focus of the removal action is removal of fill soils with arsenic concentrations above the respective target cleanup goals, the Navy will adopt a not-to-exceed goal for those fill soils that is classified as a poorly graded sand with gravel. In light of this, Decision Rules have been revised as follows:</p> <p><u>"Decision Rule 1: If the concentrations of arsenic contaminated fill soil (poorly graded sand with gravel) are below their respective target cleanup goals at Buildings 190 and 251 in all discrete samples, then no further excavation or sampling will be needed.</u></p> <p><u>Decision Rule 2: If the concentrations of arsenic exceed their respective target cleanup goals at Buildings 190 and 251 in one or more discrete samples in areas where the native/fill interface is not discernible, then</u></p> <ul style="list-style-type: none"> • further excavation will be conducted, and • a discrete soil sample will be collected from each re-excavated area and analyzed for arsenic, and cleanup in the localized area will be reevaluated based on Decision Rules 1 and 2. <p><u>Decision Rule 3: If the concentrations of arsenic in native soil, exceed the target cleanup goals for the fill soils at Buildings 190 and 251 then the residual risk will be calculated based on the results of all discrete samples for documentation purposes, and no further excavation or sampling will be conducted *</u></p> <p>Decision Rule 3 is included to preclude having to excavate native soils with arsenic concentrations above 17.5 mg/kg at Building 190 and 35 mg/kg at Building 251, which are by definition not the focus of this removal action.</p> <p>Lastly, The "Tolerable Limits on Decision Error" are still applicable since they are the basis of developing a statistics based confirmation sampling strategy at Building 190, rather than judgmental confirmation sampling design at Building 251.</p>

Document Title:

(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.
 Reviewer: Anantaramam (Ram) Peddada, Remedial Project Manager, Base Closure and Reuse Unit, Office of Military Facilities, Department of Toxic Substances Control; comments dated June 25, 2004.

Comment No.	Section/ Page No.	Comment	Response
Comments from Ronald Okuda Geologist			
1.	Section 2.1 Removal Action Objectives, Page 2-1	One of the stated Removal Action Objectives is to "Remove or treat the arsenic-contaminated soil at Building 190 and its vicinity with concentrations exceeding the background concentration of 17.5 mg/kg." Figure B-1 in the Appendix B shows sample locations 3A (arsenic at 28.9 mg/kg at 6 inches bgs) and 13A (arsenic at 17.2 at 1 foot bgs and 29.7 at 2 feet bgs) outside the removal action area. The proposed removal action area should be expanded to encompass and remove the soil from the above sample locations.	<p>The Preliminary Assessment conducted in October 2001 concluded that the elevated arsenic concentrations at Buildings 190 and 251 were associated with the fill soils imported during two backfilling events. The removal action area is based on the extent of the arsenic-contaminated fill soil and is consistent with the removal action scope presented in the Action Memorandum. Please note the focus of the removal action is on the arsenic-contaminated soil, which consists of only the non-native olive brown gravelly sand.</p> <p>The two locations 3A and 13A correspond to the native soil and not the fill soils, imported during two backfilling events. Therefore, they were placed outside the removal action area. In addition, it should be noted that the background concentration of arsenic (17.5 mg/kg) is a statistically based value (99 percentile), and therefore, concentrations higher than 17.5 mg/kg may be expected in discrete samples from native soil. Please see attached normal probability plot for arsenic (<i>Draft Final Background Concentrations of Metals Issue Paper</i>, BNI 1996b), which shows several samples above 17.5 mg/kg and some above 30 mg/kg.</p> <p>Additional samples at these two locations 3A and 13A will be collected to verify that native soils are present, and to verify that the arsenic concentrations are consistent with the background range.</p>
2.	Section 2.4 Excavation Design, Page 2-9	This section states that the excavation will be approximately 1 foot bgs and proceed to a depth of approximately 2.5 feet bgs. If this means that the excavation will result in soil removal to various depths, then the figures should be revised to outline the individual areas and depths of excavation. In addition, each separate area of a particular excavation depth should be considered a separate population area with the number and location of verification samples designated for that population.	<p>The individual areas and depths (shown as Depth of Fills) have been provided in Figure 2-1, page 2-13 of the Draft Work Plan.</p> <p>The conceptual model for the site is based on the placement of fill during a single event at each building. Therefore, confirmation sampling was based on fill soil as being one population. In addition, the PA data does not show stratification of arsenic concentrations with depth.</p>

Document Title:

(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.
 Reviewer: Anantaramam (Ram) Peddada, Remedial Project Manager, Base Closure and Reuse Unit, Office of Military Facilities, Department of Toxic Substances Control; comments dated June 25, 2004.

Comment No.	Section/ Page No.	Comment	Response
6.	Appendix A Section 1.1.5 Development of a Decision Rule	Note Decision Rule 2: It contradicts the removal action objectives for Buildings 190 and 251. DTSC disagrees with Decision Rules 2, 3, and 4, as shown on page A-2. Specifically, DTSC agreed to clean-up standards for arsenic of 17.5 and 35 mg/kg at Buildings 190 and 251, respectively, based on ambient conditions of arsenic in soil at MCAS Tustin. These clean-up standards are now to be applied as "not-to exceed" or performance standards. Therefore, if any confirmation sample exceeds these values, additional removal would be required. Because these performance standards are absolute, the "Tolerable Limits on Decision Error" described in Section 1.1.6 on pages A-2 and A-3 are not applicable. Section 1-1-7 sampling design has to be revised according to DTSC comment.	<p>Since the focus of the removal action is removal of fill soils with arsenic concentrations above the respective target cleanup goals, the Navy will adopt a not-to-exceed goal for those fill soils that is classified as a poorly graded sand with gravel. In light of this, Decision Rules have been revised as follows:</p> <p><u>"Decision Rule 1: If the concentrations of arsenic contaminated fill soil (poorly graded sand with gravel) are below their respective target cleanup goals at Buildings 190 and 251 in all discrete samples, then no further excavation or sampling will be needed.</u></p> <p><u>Decision Rule 2: If the concentrations of arsenic exceed their respective target cleanup goals at Buildings 190 and 251 in one or more discrete samples in areas where the native/fill interface is not discernible, then</u></p> <ul style="list-style-type: none"> • further excavation will be conducted, and • a discrete soil sample will be collected from each re-excavated area and analyzed for arsenic, and cleanup in the localized area will be reevaluated based on Decision Rules 1 and 2. <p><u>Decision Rule 3: If the concentrations of arsenic in native soil, exceed the target cleanup goals for the fill soils at Buildings 190 and 251 then</u> the residual risk will be calculated based on the results of all discrete samples for documentation purposes, and no further excavation or sampling will be conducted "</p> <p>Decision Rule 3 is included to preclude having to excavate native soils with arsenic concentrations above 17.5 mg/kg at Building 190 and 35 mg/kg at Building 251, which are by definition not the focus of this removal action.</p> <p>Lastly, The "Tolerable Limits on Decision Error" are still applicable since they are the basis of developing a statistics based confirmation sampling strategy at Building 190, rather than judgmental confirmation sampling design at Building 251.</p>

Document Title:

(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.
 Reviewer: Anantaramam (Ram) Peddada, Remedial Project Manager, Base Closure and Reuse Unit, Office of Military Facilities, Department of Toxic Substances Control; comments dated June 25, 2004.

Comment No.	Section/ Page No.	Comment	Response
Comments from Ronald Okuda Geologist			
1.	Section 2.1 Removal Action Objectives, Page 2-1	One of the stated Removal Action Objectives is to "Remove or treat the arsenic-contaminated soil at Building 190 and its vicinity with concentrations exceeding the background concentration of 17.5 mg/kg." Figure B-1 in the Appendix B shows sample locations 3A (arsenic at 28.9 mg/kg at 6 inches bgs) and 13A (arsenic at 17.2 at 1 foot bgs and 29.7 at 2 feet bgs) outside the removal action area. The proposed removal action area should be expanded to encompass and remove the soil from the above sample locations.	<p>The Preliminary Assessment conducted in October 2001 concluded that the elevated arsenic concentrations at Buildings 190 and 251 were associated with the fill soils imported during two backfilling events. The removal action area is based on the extent of the arsenic-contaminated fill soil and is consistent with the removal action scope presented in the Action Memorandum. Please note the focus of the removal action is on the arsenic-contaminated soil, which consists of only the non-native olive brown gravelly sand.</p> <p>The two locations 3A and 13A correspond to the native soil and not the fill soils, imported during two backfilling events. Therefore, they were placed outside the removal action area. In addition, it should be noted that the background concentration of arsenic (17.5 mg/kg) is a statistically based value (99 percentile), and therefore, concentrations higher than 17.5 mg/kg may be expected in discrete samples from native soil. Please see attached normal probability plot for arsenic (<i>Draft Final Background Concentrations of Metals Issue Paper</i>, BNI 1996b), which shows several samples above 17.5 mg/kg and some above 30 mg/kg.</p> <p>Additional samples at these two locations 3A and 13A will be collected to verify that native soils are present, and to verify that the arsenic concentrations are consistent with the background range.</p>
2.	Section 2.4 Excavation Design, Page 2-9	This section states that the excavation will be approximately 1 foot bgs and proceed to a depth of approximately 2.5 feet bgs. If this means that the excavation will result in soil removal to various depths, then the figures should be revised to outline the individual areas and depths of excavation. In addition, each separate area of a particular excavation depth should be considered a separate population area with the number and location of verification samples designated for that population.	<p>The individual areas and depths (shown as Depth of Fills) have been provided in Figure 2-1, page 2-13 of the Draft Work Plan.</p> <p>The conceptual model for the site is based on the placement of fill during a single event at each building. Therefore, confirmation sampling was based on fill soil as being one population. In addition, the PA data does not show stratification of arsenic concentrations with depth.</p>

Document Title:

(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.
 Reviewer: Anantaramam (Ram) Peddada, Remedial Project Manager, Base Closure and Reuse Unit, Office of Military Facilities, Department of Toxic Substances Control; comments dated June 25, 2004.

Comment No.	Section/ Page No.	Comment	Response
3.	Section 2.7		
A.	Confirmatory Sampling Design, Page 2-17	This section states that the number of samples at Building 190 and vicinity was calculated using the Visual Sample Plan Software (Pacific Northwest National Laboratory, Version 2.2). See comment #6.	See Response to Comment #6.
B.		The number of verification sample should be increased to assure that the elevated arsenic concentrations do not extend beyond the excavation area. Two sidewall samples in the Building 190 area are not sufficient. At a minimum, sidewall samples should be collected along the sidewall at 50 feet interval spacing. Note that there is no data to define the extent of the elevated arsenic along the southern side of the Building 190 excavation and limited data for the other sidewalls.	The sampling plan will be revised to state that in consultation with regulatory agencies, up to ten additional sidewall samples may be collected to confirm that the arsenic contaminated fill soils have been removed, if the contact between the native and the fill soil is not readily discernible in the field. The extent of the elevated arsenic along the southern side of Building 190 has been delineated based on results obtained during the PA in 2004 as shown in Figure B-2, Appendix B of the Draft Work Plan.
C.		There are two almost square-shaped excavations are proposed for the Building 251 area. A verification sidewall soil sample should be collected from each sidewall.	A verification sample will be collected from each sidewall at the two-hotspot locations for the Building 251 area.
D.		The number of verification bottom samples may be appropriate if the contact between the fill soil and native soil is readily discernible (e.g., differences in lithology, color, structure, etc.) in the field. If the contact between the fill soil and native soil is not discernible, additional bottom samples should be collected. In addition, if the excavation results in removal of soil to different depths, then additional bottom verification of each area should be conducted.	The fill, which was predominantly a mixture of an olive-brown gravelly sand and a sandy gravel, was easily discerned from the native soil, which was consistently a black silty clay during the 2001 and 2004 Preliminary Assessments. Thus as documented in sampling design (Section 1.1.7, Appendix A) the number of verification bottom samples are adequate to conclude that the removal action objectives have been achieved. Additional rounds of excavation and confirmatory sampling will be conducted if the data from the first round of confirmatory sampling indicates that cleanup has not been attained at the site.

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Reviewer: Anantaramam (Ram) Peddada, Remedial Project Manager, Base Closure and Reuse Unit, Office of Military Facilities, Department of Toxic Substances Control; comments dated June 25, 2004.

Comment No.	Section/ Page No.	Comment	Response
Appendix A			
4.	Section 1.1.5 Development of a Decision Rule	Note Decision Rule 2: It contradicts the removal action objectives for Buildings 190 and 251.	See Response to Comment #6.
5.	Section 2.1.3 Cleanup Confirmation Sampling, Page A-8	The Work Plan should provide detailed information on how the bottom and sidewall samples will be collected. Since the method of sampling is for one chemical, reference to other SAPs [SOPs] should be avoided so that the collection and analytical procedures are completely documented in the Work Plan. Discrete sidewall samples should be collected. Collection of discrete sidewall samples at multiple depths below ground surface, visible signs of discolored soil, changes in soil lithology and at the discretion of regulatory agencies should be incorporated into the Work Plan.	Soil Samples will be collected using unused disposable trowels, in accordance with CLEAN SOP 4, Soil Sampling (BNJ 1999). CLEAN SOP 4 will be attached as an Appendix to the Work Plan. Confirmation sampling will be collected in accordance with the approved Work Plan. Additional discretionary samples, within the framework and criteria presented in the approved Work Plan, will be considered during confirmation sampling.

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(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.

Reviewer: James A. Ricks, United States Environmental Protection Agency, San Diego; comments dated June 29, 2004

Comment No.	Section/Page No.	Comment	Response
General Comments			
1.		EPA's review has determined that the subject document is clear relative to scope and purpose. However, several sections of the subject document appear unclear regarding the implementation of specific components of the work plan (See specific comments discussed below). A primary concern which EPA believes will require further BCT consultation is the discussion of the sampling verification methodology for Buildings 190 and 251. This concern is discussed under specific comment number 2 cited below.	Noted.
Specific Comments			
1.	Section Removal Action Design, Page 2-1	<p>The text states that the removal action objectives for the As AOC removal are: 1) excavate As-contaminated soil at two hotspot locations at or near Buildings 190 and 251 "with concentrations exceeding the background concentration of 17.5 mg/kg;" [1] excavate As-contaminated soil at Building 190 and its vicinity and at two hotspot locations at Building 251 "with concentrations exceeding the background concentration of 17.5 mg/kg and two times above the background concentration of arsenic, i.e. 35 mg/kg respectively] and 2) remove exposure pathways from potential receptors.</p> <p>In regards to the first objective, EPA's review of the preliminary assessment sampling results for 2001 depicted in Figure B-1 (Appendix B) indicates that two sample locations appear outside the boundaries of the removal action sampling grid (i.e., 3A As at 28.9 mg/kg @ 6 inches bgs] and 13A As at 17.2 at 1 foot bgs and 29.7 @ 2 feet bgs). However, in comparing Figure B-1 to Figure 2-4 "Proposed Confirmation Soil Sampling Locations," it does appear that the two sample locations (3A and 13A) are included within the sampling grid. This is an inference given that the two sampling locations are not depicted on Figure 2-4. Please confirm.</p>	<p>The Preliminary Assessment conducted in October 2001 concluded that the elevated arsenic concentrations at Buildings 190 and 251 were associated with the fill soils imported during two backfilling events. The removal action area is based on the extent of the arsenic-contaminated fill soil and is consistent with the removal action scope presented in the Action Memorandum. Please note the focus of the removal action is on the arsenic-contaminated soil, which consists of only the non-native olive brown gravelly sand.</p> <p>The two locations 3A and 13A correspond to the native soil and not the fill soils, imported during two backfilling events. Therefore, these two locations though a part of the sampling grid, are placed outside the removal action area and are not the locations of concern. In addition, it should be noted that the background concentration of arsenic (17.5 mg/kg) is a statistically based value (99 percentile), and therefore, concentrations higher than 17.5 mg/kg may be expected in discrete samples from native soil. Please see attached normal probability plot for arsenic (<i>Draft Final Background Concentrations of Metals Issue Paper</i>, BNI 1996), which shows several samples above 17.5 mg/kg and some above 30 mg/kg. Additional samples at these two locations 3A and 13A will be collected to verify that native soils are present, and to verify that the arsenic concentrations are consistent with the background range.</p>

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Reviewer: James A. Ricks, United States Environmental Protection Agency, San Diego; comments dated June 29, 2004

Comment No.	Section/Page No.	Comment	Response
2.	Section 2.7 Confirmatory Sampling Design, Page 2-17	<p>The draft work plan references the Navy's utilization of Visual Sample Plan Software as the basis for determining the appropriate number of discrete confirmation samples at locations near Building 90 [190]. EPA is not familiar with this particular software and recommends that the Navy be given an opportunity to present the technical methodology of this approach at a BCT-convended teleconference to discussed the draft work plan. This component of the work plan is critical because it will present the technical basis for rendering a decision relative to confirming that the removal objectives have been achieved. Accordingly, the sampling strategy selected for confirmation sampling must be sufficient in number, appropriate in location and systematic in approach.</p> <p>EPA notes that DTSC, in correspondence to the Navy dated 25 June 2004 re subject draft work plan, raised concerns relative to whether the number and location (interval frequency) of sidewall samples located in or near Building 190 is, respectively, sufficient and appropriate (i.e., "two sidewall samples in the Building 190 area are not sufficient."). Further, DTSC recommends additional sidewall sample be collected along the sidewall at 50 feet to 75 feet interval spacing. EPA recommends that this issue be further explored at the aforementioned teleconference with the specific intent to reach an early consensus regarding the confirmation sampling design. In previous BCT discussions, the Navy's confirmatory sampling design for the AOC As was based upon a technical rationale that focused initially on confirmation sampling at the bottom of the excavation at Bldg 190 in order to determine that the goals have been met (i.e., cleanup to background As concentrations @ 17.5 mg/kg). The bottom and sidewall verification sampling locations were based upon the highest concentration of As detected in the initial sampling.</p>	<p>Visual Sample Plan (VSP) has been developed by the Pacific Northwest National Laboratory for the US Department of Energy to support environmental characterization and confident decisions. VSP is a software tool sponsored by the US Department of Energy, US Environmental Protection Agency, and the US Department of Defense. It is based on the DQO process that specifically facilitates the last two steps of the DQO process, namely, Determining Acceptable Decision Error Tolerances, and Optimal Sampling Design. It helps in determining optimal number of samples using defensible statistical sampling design methods.</p> <p>The model evaluation parameters and assumptions for calculating the number of samples at Building 190 and its vicinity are provided in Section 1.1.6 of Appendix A of the Draft Work Plan. The number of samples calculated by VSP using the formula shown below is based on EPA guidance "EPA 2000. <i>Guidance for Data Quality Assessment</i>. EPA QA/G-9, U.S. EPA, Office of Research and Development, Quality Assurance Division, Washington DC."</p> $n = S_{Total}^2 (Z_{1-\alpha} + Z_{1-\beta})^2 / \Delta^2 + 0.5Z_{1-\alpha}^2$ <p>where: n is the recommended minimum sample size, S_{Total} is the estimated standard deviation, $Z_{1-\alpha}$ is the value of the standard normal distribution for which the proportion of the distribution to the left of is $1-\alpha$ where α is the false rejection rate, $Z_{1-\beta}$ is the value of the standard normal distribution for which the proportion of the distribution to the left of is $1-\beta$ where β is the false acceptance rate, and Δ is the width of the gray region.</p> <p>As suggested, a conference call to discuss these comments will be scheduled.</p>

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(1) Draft Work Plan, Non-Time Critical Removal Action, Arsenic Area of Concern, Former Marine Corps Air Station, Tustin, California, May 2004.

Reviewer: Patricia A. Hannon, SLIC/DoD Section, California Regional Water Quality Control Board, Santa Ana Region; comments dated June 28, 2004

Comment No.	Section/Page No.	Comment	Response
1.	Page 3-9 Sections 3.6 Soil Excavation and 3.7 Excavated Soil Profiling and Characterization	Please explain whether the excavated soil will be stockpiled prior to being loaded onto trucks for transport or loaded onto trucks directly after it is excavated. If the soil is to be stockpiled, please provide information such as whether the soil will be placed on a liner and provide information regarding the best management practices (BMPs) that will be implemented to prevent rain water infiltration and sediment runoff from the stockpiled soil.	The excavated soil will be temporarily mounded within the excavation footprint to facilitate efficient loading into trucks. The BMPs associated with excavation footprint will prevent runoff from the site.
2.	Page D-15, Section 4.2 Noncompliance Reporting	<p>Pursuant to Water Quality Order No. 99-08-DWQ and the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit):</p> <p>"Should it be determined by the discharger, SWRCB or RWQCB that storm water discharges and/or authorized non-storm water discharges are causing or contributing to an exceedance of an applicable water quality standard, the discharger shall:</p> <p>a. "Implement corrective measures immediately following discovery that water quality standards were exceeded, followed by notification to the RWQCB by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. This notification shall be followed by a report within 14 calendar days to the appropriate RWQCB, unless otherwise directed by the RWQCB, describing (1) the nature and cause of the water quality standard exceedance; (2) the BMPs currently being implemented; (3) any additional BMPs which will be implemented to prevent or reduce pollutants that are causing or contributing to the exceedance of water quality standards; and (4) any maintenance or repair of BMPs. This report shall include an implementation schedule for corrective actions and shall describe the actions taken to reduce the pollutants causing or contributing to the exceedance."</p>	<p>Section 4.2 will be revised as:</p> <p>"If a discharge occurs or if the project receives a written notice of non-compliance, the removal action contractor will immediately notify the U.S. Navy Remedial Project Manager (RPM) and RWQCB by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. A written report will be filed to the RPM within 7 days, and to the RWQCB within 14 calendar days of the identification of non-compliance. The report to the RPM and RWQCB will contain the following items:</p> <ul style="list-style-type: none"> • The date, time, location, nature of operation, and type of unauthorized discharge, including the cause or nature of the notice or order. • The BMP's currently being implemented. • Any additional BMPs which will be implemented to prevent or reduce pollutants that are causing or contributing to the exceedance of water quality standards. • An implementation and maintenance schedule for any affected BMPs. <p>This report shall include an implementation schedule for corrective actions and shall describe the actions taken to reduce the pollutants causing or contributing to the exceedance."</p>

